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Defense Occupational and Environmental Health Readiness System (DOEHRS) Guidance

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This document has been prepared to provide guidance to enable Bioenvironmental Engineering (BE) Flights to execute Occupational and Environmental Health (OEH) Program requirements and document relevant OEH health risk assessment data in the Defense Occupational and Environmental Health Reporting System (DOEHRS). The information in this guidance document is based primarily upon requirements of Air Force Instruction (AFI) 48-145, Occupational and Environmental Health Program, 5 March 2008.

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Preface

This document has been prepared to provide guidance to enable Bioenvironmental Engineering (BE) Flights to execute Occupational and Environmental Health (OEH) Program requirements and document relevant OEH health risk assessment data in the Defense Occupational and Environmental Health Reporting System (DOEHRS). The information in this guidance document is based primarily upon requirements of Air Force Instruction (AFI) 48-145, Occupational and Environmental Health Program, 5 March 2008.

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Defense Occupational and Environmental Health Readiness System (DOEHRS) Guidance

1. OEH Surveillance Process

The Air Force applies a uniform business practice to assess and control OEH threats. Fundamentally, this process identifies threats capable of impacting the health of people and jeopardizing their ability to execute mission tasks. Threats fall into two categories:
- Those that have the potential to result in a completed pathway of exposure. These threats must be assessed in order to identify vulnerabilities and appropriate countermeasures to minimize risk and prepare to response actions should the vulnerability be exploited or otherwise result in a completed pathway of exposure that impacts mission or health.
- Threats that result in a completed pathway of exposure. These threats may have origins in the workplace or in the environment. Regardless, each OEH threat with a completed pathway of exposure requires the completion of a health risk assessment.

DOEHRS is specifically designed to manage documentation of threats with completed pathways of exposure. DOEHRS is an **unclassified** system and is not appropriate for the documentation of vulnerabilities or any other classified data. While the Industrial Hygiene (IH) and Environmental Health (EH) modules of DOEHRS are somewhat different, the intent is for them to support a common framework of threat/hazard identification, evaluation, and control.

Currently, the EH functionality is limited to only the capture of sampling data for air, water, and soil. Additional functionality is planned to provide a framework to identify all completed pathways of exposure, create Similar Exposure Groups (SEGs), document Health Risk Assessments, identify the need and priority for additional sampling or monitoring, and to identify and prioritize control options.

The IH functionality is designed to implement the DoD Industrial Hygiene Exposure Assessment Model. While compatible, the Air Force implementation of this model per AFI 48-145, Occupational Health Program, is more of an iterative approach and is organized into two basic courses of action: Routine Assessment and Special Assessment. The section that follows provides an overview of DOEHRS ability to implement and document the surveillance process starting with Routine Assessments, while the remainder of this document provides specific detail related to each element of the Air Force Exposure Assessment Model.

The implementation of Joint Basing will pose unique challenges for BE Flights based upon the type of Joint Basing decision. Joint Basing decisions vary by the degree of support another Service is expected to support Air Force units. In some cases, the Air Force will maintain BE support of Air Force units while the Lead Service will pick up responsibility for facility infrastructure and the associated industrial hygiene support of those performing this work. In this case, it may be possible to simply end-date Air Force shops that are closed as the Lead Service establishes an equivalent function to perform this work. In other situations, the Lead Service will provide industrial hygiene support to collocated Air Force units and would possibly benefit from a transfer of historical industrial hygiene information into their DOEHRS Industrial Hygiene Program Office. BE Flights facing Joint Basing should work with their Major

Command Bioenvironmental Engineer to ensure the appropriate decisions are made for mission unique requirements and should coordinate with the Air Force lead for DOEHRS for recommendations on how best DOEHRS can support their unique requirements.

1. 1. Routine Assessment

The routine assessment is a qualitative or quantitative assessment conducted to identify and scope the processes employed to execute the assessed unit's mission. The potential health hazards and associated risks should be scoped to the extent that the workplace can be categorized and additional health assessment requirements identified. Routine Assessments can generally be accomplished in a few days or less. The principle purpose of routine assessment is to:

- Identify potential OEH hazards related to the workplace processes. DOEHRS enables the identification of potential hazards for any workplace process and can define IH Assessment requirements for each hazard across one or more processes as required.
- Assess confidence in exposure characterization, confidence in existing controls and acceptability of exposure relative to applicable standards. DOEHRS enables an IH Assessment to be documented on each Hazard across one or more Process, as required. Each IH Assessment includes the determination of an Exposure Assessment Priority (EAP), which in part is based upon the documented confidence in the exposure characterization, confidence in existing controls, and the acceptability of the exposure.
- Assign a qualitative risk to each hazard. The qualitative risk associated to each hazard is based upon the IH Assessment as discussed above.

1.2. Special Assessment

The special assessment is typically a quantitative exposure assessment that focuses resources on OEH-related hazards that require additional evaluation or classification. Special Assessments capture additional data that could not be obtained during Routine Assessments. The principle purpose of special assessment is to:

- Quantify potential exposures identified during routine assessment. DOEHRS enables the documentation of exposure measurements to chemical, biological, and physical agents. This is done at the process for non-personal sampling and at a Similar Exposure Group (SEG) for personal monitoring. DOEHRS currently documents measurements of noise sound level, noise dosimetry, air breathing zone, air general area, direct reading air, and direct reading air time-weighted average (TWA).
- Perform periodic control evaluations, e.g., ventilation surveys, to maintain confidence in the effectiveness of established controls. DOEHRS has recently added the ability to define ventilation systems; identify their critical components; perform airflow velocity measurements; calculate airflow volumes; and ultimately determine the adequacy of the control. Additionally, control recommendations can be made against a SEG and subsequently documented as a deficiency in order to prioritize the implementation of the recommended control.
- Evaluate unscheduled requests, e.g., pregnancy evaluations, OEH illness investigations. DOEHRS does not currently have the ability to manage the scheduling of these unscheduled requests, but any exposure measurements can be documented, along with documentation in an Observations and Notes section. Additionally, written reports may be uploaded to DOEHRS for retention.

- Provide follow-up action on recommendations or direction from the OEHWG. Again, DOEHRS does not specifically track OEHWG action items, but OEHWG recommendations should be documented in OEHWG minutes and there should be appropriate documentation in DOEHRS Master Schedule and Workplace Monitoring Plan to assess the BE Flight follow-up on such recommendations.
- Sustain compliance with regulatory requirements. Periodic sampling can be scheduled and tracked using the Master Schedule and Workplace Monitoring Plan. The scheduled tasks are associated with the sample documentation and results throughout DOEHRS. Additionally, regulations that drive surveys can be annotated on the Master Schedule.
- Special assessment requirements are generally identified during routine assessment but may also be identified by other means, e.g., illness or injury reports. Regardless of the source of identification, special assessment requirements can be scheduled and tracked using the Master Schedule and Workplace Monitoring Plan as summarized above.
- Provide commander and affected individuals with a summary of the outcome of the special assessment, plans for additional evaluations and recommended actions to reduce hazard/risk to acceptable levels. DOEHRS has summary reports for each shop and SEG that provides a summary of assessments, identifies additional evaluations required, and identifies deficiencies and recommended actions to reduce hazard/risk to acceptable levels. These data outputs may be used as supporting attachments to a short summary report written in memo format.

2. Air Force Exposure Assessment Model – Routine Assessment.

The Air Force Exposure Assessment Model is compatible with the DoD Industrial Hygiene Exposure Assessment Model, which is the basis of DOEHRS functionality. ***The major difference is the Air Force's clear requirement to complete a Health Risk Assessment as part of Routine Surveillance.*** It is recognized that additional data may be needed to increase confidence in the exposure categorization; however, a decision regarding the acceptability of exposure and associated controls is required during the Routine Surveillance process. This should be documented as identified during periodic workplace surveys and during authorization of hazardous material usage. Special Surveillance allows for the prioritization of resources to increase the confidence in existing Health Risk Assessments through the collection of additional exposure data. Figure 1 provides an overview of the Routine Surveillance process. Again, it is important to note the inclusion of a health risk assessment as part of this process, along with the need to communicate results. These items will be elaborated on further in this document. Each of the exposure assessment models referenced above are based on *A Strategy for Assessment and Managing Occupational Exposure*, Third Edition, AIHA, 2006. The AIHA guidance document should be required reading for all individuals performing industrial hygiene risk assessment.
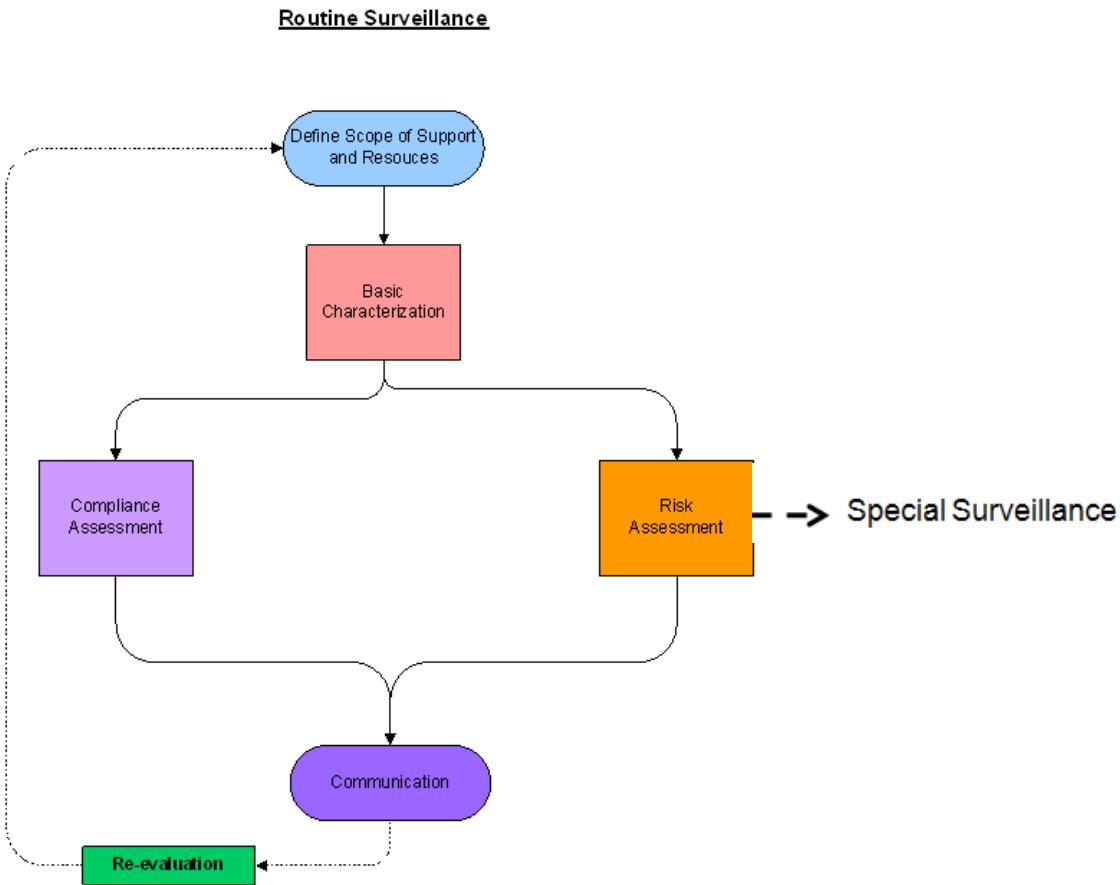
Figure 1. Air Force Routine Surveillance Process

2.1. Define Scope of Support and Resources
Prior to using DOEHRS for industrial hygiene surveillance, the system must first have preliminary information added. This initial set-up includes program office personnel, program office equipment used for sampling or monitoring, supported organizations, and laboratories used for analysis.

2.1.1. Program Office Personnel
Essentially, all BE personnel will be Program Office Personnel in DOEHRS. Program Office Personnel are DOEHRS users who perform functions within the program office data set based on the roles they are assigned. Users request the roles they will need based on their responsibilities within the program office and are granted access by the program office Unit Security Administrator (USA). The USA may also add or remove requested roles during the application process prior to approval. Each BE Flight should have at least one primary and one alternate USA identified.

2.1.1.1. Program Office Personnel information is accessed through the *Administration>Program Office Personnel* link on the navigation menu. From this page the USA may manually lock and unlock PO personnel accounts. The program office's Data Administrator may also update

information for the PO Personnel by accessing the *Program Office Personnel - Detail* page by selecting the link for the individual user. The USA may also update individual user roles as needed from the *Program Office Personnel – Detail* page.

2.1.1.2. New PO Personnel user account requests will be accessed by the PO USA from the *Administration>Pending Account Requests* link. The USA will review each requests and either approve or deny that requests. If the USA is going to approve the account they will need to verify the information contained on the application and ensure the user roles that have been requested are correct. The USA may change the requested roles as necessary prior to approval of the account request.

2.1.1.3. By approving the requests the USA is accepting responsibility for verifying the user's need to access DOEHRS. The USA is also agreeing to apply a stop date to the user's accounts when access is no longer required. Do not simply lock the account as this will complicate matters when the user potentially arrives at another location and attempts to gain access to a new program office.

2.1.2. Program Office Equipment
In DOEHRS, vendors are manufacturers, calibrators, and suppliers of the program office industrial hygiene (IH) equipment.

2.1.2.1. Vendors. During the PO set-up, vendors must be added prior to adding the IH equipment. Vendors are added to DOEHRS from the *Administration>Vendors* link. DOEHRS allows the user to add vendor names, contract number, address, email, and contact phone number. Once vendors are added, they can be further identified as manufacturers, suppliers, or calibrators when adding IH equipment to the program office.

2.1.2.2. Program Office Equipment. Equipment is added through the *Administration> Program Office Equipment* link. The equipment administrator may perform several functions from the *Program Office Equipment – Search* screen. By selecting the appropriate link, the equipment administrator may search for active and archived PO IH equipment, add program office equipment and generate program office equipment life expectancy report.

2.1.2.2.1. IH Equipment records currently in the PO data set may be accessed by performing a search and selecting the appropriate link in the *Program Office Equipment Name* column. This opens the *Program Office Equipment - Detail* page where the PO Equipment record may be updated as needed.

2.1.2.2.2. To add new IH equipment the equipment administrator may select the *Add Program Office Equipment* link on the search screen. An *Add Program Office Equipment - Select Name* page will allow the user to select the IH equipment name. After selecting *Continue*, the user will complete the *Program Office Equipment - Detail* page.

2.1.2.2.3. The model and serial numbers are required fields. A model number may be selected via the drop down, added, or edited via the icons to the right of the drop down. The model

number is where the national stock number, manufacturer, supplier, life expectancy, calibration frequency, and replacement costs are stored and associated with a particular IH equipment item. Pay particular attention to this area and populate all fields if possible. A lot of information is associated with the model number.

2.1.2.2.4. The equipment administrator may also populate the other program office equipment information fields to the property and maintenance numbers, reference information, the site assigned, and notes specific to this piece of equipment and whether the item is available for use or not.

2.1.2.2.5. The *Potential Interferences* menu tile is populated if that information is entered with the model number.

2.1.2.2.6. Information pertaining to the calibration and maintenance is updated on this page in the *Calibration and Maintenance History* menu tile. The date sent, actual calibration date, calibration lab, calibration cost, and maintenance cost are entered by the equipment administrator and is then viewable in the calibration summary where the last calibration date, calibration frequency, next calibration date, and daily calibration methods are located.

2.1.2.2.7. The *Cost Summary* menu tile is used to document the purchase date, purchase cost, calculated replacement cost, maintenance cost, calibration cost, and total cost.

2.1.2.2.8. The Program Office Equipment Information pertaining to life expectancy and replacement costs are used to populate the *Program Office Equipment Life Expectancy* report while the calibration frequency is used to calculate the next calibration due date.

2.1.3. Laboratories
Labs that are used by the program office to analyze samples can be entered into DOEHRS. Laboratories are added to DOEHRS from the *Administration>Labs* link.

2.1.3.1. Add a lab by clicking the *Add Record* icon (+) or by selecting *Add Labs* from the *Other Actions* drop down menu.

2.1.3.2. The user must enter a Lab name and start date but may also enter other information to include lab code, contract number, contact name, email address, mailing address, and phone number.

2.1.3.3. Analytical methods are selected by expanding the *Analytical Methods* menu tile. The user will need to select the link(s) that corresponds to the method(s) they need to add. The user may add all analytical methods that apply by selecting the appropriate check boxes and saving the record. This must be done for all methods the lab performs. Though tedious, it only needs to be accomplished once and then maintained if there are any changes.

2.1.3.4. The lab information will populate the *Sampling Method – More Information* form. This information is accessed when entering a sampling tasks and selecting methods. If the PO uses

more than one lab, they can view the *Sampling Method – More Information* form to determine which lab or labs is capable of performing the analysis. The *Sample Log* also displays samples that have been sent to a Lab. If a lab is not annotated on the sample form, then the sample log will not display outstanding samples.

2.1.4. Identify Supported Organizations
BE Flights are typically responsible for supporting all organizations attached to their parent Wing, as well as other Air Force units collocated on their installation and other DoD units as defined by Host Tenant Agreements. BE Flights are also responsible for units at supported Geographically Separated Units in a similar manner. Each level of the organizational structure from the detachment, squadron, group, wing, numbered air force, and major command will be assigned a Unit Identification Code (UIC). The UIC is related directly to the Air Force PAS Code. The lowest level for a UIC is defined at the squadron or operation location/detachment level. Each UIC should have a parent UIC identified based upon data updates provided by the Defense Manpower Data Center (DMDC). Each of the organizations supported by the BE Flight should be identified in DOEHRS as a Supported Organization. Subsequently, those workplaces within an organization having potential exposure to occupational or environmental stressors should be identified as Shops.

2.1.4.1. In DOEHRS, Supported Organizations are added to a Program Office under the *Administration>Supported Organizations* link. Select *Add Supported Organizations* from the *Other Actions* drop down menu. Use the search function to narrow the list of organizations for the program office area of responsibility. It is helpful to use the zip codes of the major installations being supported by the program office to quickly narrow the list.

2.1.4.2. From the search results list, select the check boxes next to each organization that your program office supports and click the *Add to Supported Organizations* button. The selected organizations may now be utilized by DOEHRS. By accomplishing this step, users can also *Browse by Organization Tree*. This view shows all organizations supported by the Program Office. Parent organizations are automatically displayed, i.e., squadron belongs to group that belongs to a wing, etc.

2.1.5. Identify Shops
DOEHRS is designed around the concept of Shops to identify those workplaces **under an organization** that contain a potential for exposure to occupational health risks. It is best to periodically meet with representatives from all Supported Organizations to determine the "workplaces" that should be characterized as a Shop with the purpose being to ensure all workers with potential for exposure to chemical, physical, biological agents are accounted for. Once all the preliminary information is set up under the scope of support and resources, the program office may begin entering shops.

2.1.5.1. In order to add Shops to DOEHRS, navigate to the *Shop* link under the *Industrial Hygiene* menu. On the *Shop – Search* screen click the *Add Shop* link. At a minimum, enter a Shop Name, Start Date, Shop Priority, an Organization/UIC Name and press the *Save* button.

Shop Codes are not required and users should discontinue the use of these codes, particularly as part of the shop name, as they provide no value to the data collection.

2.1.5.2. DOEHRS supports the requirement to "categorize workplaces based on potential OEH risk to workers." Each Shop is assigned a workplace priority of 1 (High), 2 (Medium), or 3 (Low) based upon AFI 48-145, Table 1.1 Workplace Categorization and Required Routine Assessment Frequency. In DOEHRS, this is documented for each Shop using a radio button to assign the *Shop Priority*. While there is some discretion regarding how frequently the Basic Characterization should be validated, AFI 48-145 provides adequate guidance on the factors to consider when determining shop priority and the corresponding frequency of visit. Additionally, it is important to integrate the hazardous material management requirements of AFI 32-7086, Hazardous Material Managements, into the routine assessment process. The "authorization" of hazardous materials is essentially the association of material to DOEHRS processes and a determination as to the adequacy of the basic characterization and SEG assessment. The introduction of new hazards can be identified during the authorization process, which in-turn should drive updated assessments and the subsequent prioritization of special surveillance requirements.

2.1.6. Create Routine Surveillance Schedule
Routine shop visits are scheduled in DOEHRS as Periodic Surveys. These surveys are scheduled by adding a task in the Master Schedule. ***There is no reason to identify one of the periodic surveys as a baseline survey, despite that being a type of survey in DOEHRS.***

2.1.6.1. Navigate to the *Master Schedule* link under the *Work Plan* menu tile.

2.1.6.2. On the *Master Schedule – Search* page click the *Add Master Schedule Task*.

2.1.6.3. Select the *Task Type* by using the drop down and clicking on *Periodic Survey* and then press continue.

2.1.6.4. On the *Master Schedule - Detail – Periodic Survey* page the user will select the Shop Name and enter Task Frequency and Projected Start Date and the Expected Completion Date. It is recommended to use the first day of each scheduled month as the Projected State Date and the last day of each month as the Expected Completion Date. The user may also enter other task related information like regulations (for compliance requirements) and may assign task personnel and add resource and cost information.

2.1.6.5. All scheduled surveys may be accessed by navigating to the *Shop>Survey* link and selecting the appropriate survey or through the *Master Schedule*.

2.2. Basic Characterization
At this point, the preliminary information in DOEHRS has been entered and the BE Flight may now begin to execute their routine surveillance mission.

2.2.1. Schedule and Conduct Periodic Survey with Shop

After a shop has been scheduled for a visit in the Master Schedule, the assigned personnel may wish to contact the shop point of contact and confirm the actual date for the Routine Survey. This contact with the shop may be documented in the *Observations and Notes* section after selecting a specific *Shop*. The BE Flight personnel will need to gather data during the shop visit to facilitate the basic characterization. Upon visit with the shop, it is important to identify or update the shop personnel roster, and identify or update processes performed, along with associated personnel, equipment, controls, and hazards. Additionally, a compliance inspection of relevant program areas should be conducted; documenting deficiencies or other observations.

Figure 2. Document Observations and Notes

2.2.1.1 Navigate to the *Industrial Hygiene* menu tile, click the *Shop* link and search for the specific shop. Once the shop is selected the user may select the *Observations and Notes* link (Figure 2).

2.2.1.2. Select *Add an Observation* from the *Other Actions* drop down.

2.2.1.3. Enter a start date and the appropriate details in the comments field to document the conversation with the shop point of contact.

2.2.2. Update Shop Personnel Roster

Update the shop personnel roster in DOEHRS. Demographic data for an organization is fed to DOEHRS through interfaces with the Defense Manpower Data Center (DMDC). This data associates people to their various organizations. To execute the IH function properly, people must ultimately be associated to shops and processes. Active management of personnel within the DOEHRS application is necessary to ensure exposures are adequately documented for all assigned personnel. Figure 3 illustrates how personnel flow from DMDC into DOEHRS. Personnel must first be added to a shop, then to processes, and finally grouped into Similar Exposure Groups (SEGs).
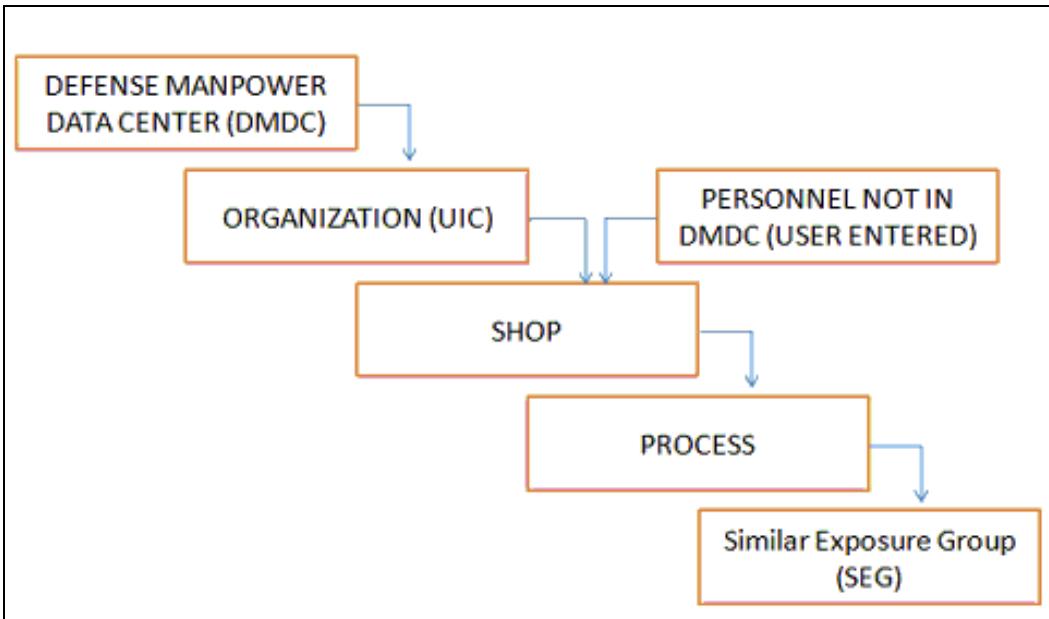
Figure 3. Personnel Data from DMDC

2.2.2.1. Expand the node for the shop name under the *Shop* link within the *Industrial Hygiene* menu. Select the *Shop Personnel* link (Figure 4) and the *Shop Personnel* list will be viewable. Several actions may be accomplished from this page. Personnel may be added through the Add from Personnel Assigned to the UIC or via the "*Add Record*" icon or *Other Actions* drop down menu (Figure 5). Users may also choose to import personnel to the shop through the *Import Personnel* button.
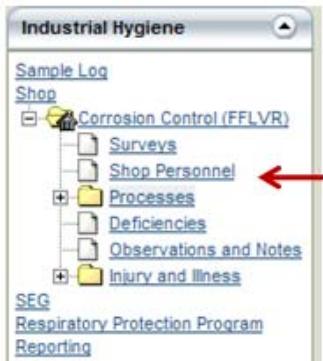
Figure 4. Shop Personnel

Figure 5. Add Personnel from the UIC

2.2.2.2. When using the *Add Personnel from the UIC* button, the user will be able to select employees from those already associated with the UIC. However, if the employee is not currently associated with the UIC at DMDC the user will need to use one of the other methods described below. There is a change request to allow the selection of workers from other UICs should workforce utilization include a combination of active and reserve component members or members from multiple Service components.

2.2.2.3. Adding personnel through the "*Add Record*" icon or the *Other Actions* drop down requires the user to have the complete social security number. A pop up window (Figure 6) will prompt for the SSN to search the DMDC interface for the new employee. The Find Personnel Results screen will list the employee if they are found within the DMDC interface and the user will be prompted to *Add to Form*. If the social security number is not found, the user will be prompted to enter the first name, last name, date of birth, and gender and press the *Add to Form* button. This action will allow users to add personnel to DOEHRS if they are not found in the DMDC database.

Figure 6. Search for Personnel

2.2.2.4. Regardless of which method above is used to add the worker to the shop the user will need to complete the *Shop Personnel – Details* screen. The user will need to add a *Shop Start Date* and a *Worker Type* (i.e. DoD civil service employee, active duty member, etc.) if that information is not in DMDC or if the worker has multiple worker types already associated with them (i.e. DoD Civil Service and also a Reserve Member). Users may also enter data about the work shift at this screen.

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2.2.3. Add or Update Processes
Processes are simply "work units" bounded at a level necessary to assess and control risk as part of the Health Risk Assessment. More succinctly, processes must be identified and defined to a level low enough that will allow for IH professionals to be able to conduct assessments against all hazards present in the process.

2.2.3.1. Information pertaining to the processes that occur within the shop will need to be added to DOEHRS under the *Shop* and *Processes* link (Figure 7).
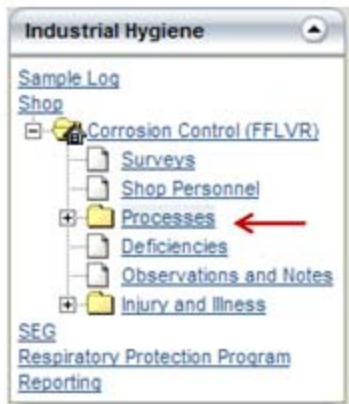
Figure 7. Shop Processes

2.2.3.2. Expanding the *Processes* link will display a list of existing processes for the given shop. Clicking the *Process Name* will open up the *Process Information* page for edit as appropriate (Figure 8). The user may then add a process via the *Add Record* icon or *Other Actions* drop down menu.

2.2.3.3. The user will need to enter a *Process Name* and then select the *Process Category*, *Common Process*, and *Method* from the drop down boxes. Each drop down selection is filtered based on the preceding choice (i.e. the *Process Category* filters the selection option for the *Common Process*, which in-turn filters the selections for *Methods*). The user must enter a start date, process frequency, and process duration. Users may also choose to add one or more Weapon Systems, a location, and attachments to the process.

Figure 8. Process Details

2.2.4. Add Personnel to the Process

In order to properly identify personnel with similar exposure for inclusion in a Similar Exposure Group, people performing the same process must be identified and associated to the DOEHRS processes for their workplace.

2.2.4.1. To add personnel to the process expand the node (⊞) next to the selected process name and select the *Personnel* link (Figure 9). This will open the *Personnel* roster for the process. Adding personnel to processes is very similar to adding them to the Shop. The user may add personnel to the process by clicking the *Add from Personnel Assigned to the Shop List* button. This will present the user with a filtered list of personnel who are already assigned to the shop but have not been added to the process. The user will need to select the employees by checking the box and pressing the *Continue* button. The next step requires that a start date for the process be entered and the record saved.
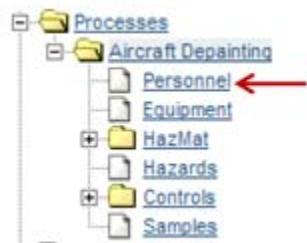
Figure 9. Process Personnel

2.2.4.2. If the employee is not currently associated with the shop, the user may still add them similar to how they can be added to a Shop as previously discussed.

2.2.5. Add Equipment to the Process

Document all equipment items in the shop that create a hazard in the process. These are typically going to be items that create a physical hazard to the worker such as noise or radiation. DOEHRS enables the documentation of radioactive material as hazard sources, but the actual management of radioactive material will be accomplished within RAMMIS.

2.2.5.1. Navigate to the *Equipment* link under the appropriate process (Figure 10).
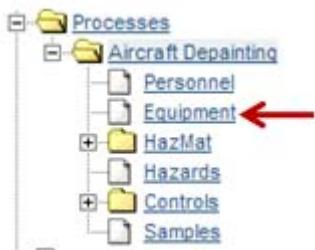
Figure 10. Process Equipment

2.2.5.2. Add equipment to the process by selecting the appropriate equipment type from the *Other Actions* drop down (Figure 11). Note that most equipment types are radiation producing. These forms have very specific data fields appropriate for the type of radiation producing equipment of concern.
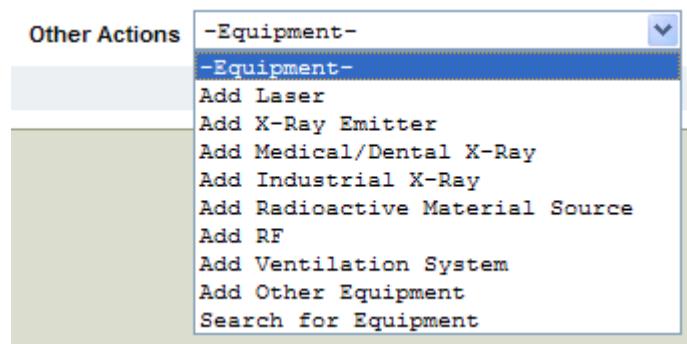
Figure 11. Equipment Types

2.2.5.3. Complete the *Equipment – Detail* page for each specific type of equipment item. The user will then select which hazard is created by the equipment item. DOEHRS enables the documentation of equipment operational parameters but does not yet enable the completion of survey measurements against the identified equipment with the exception of noise measurements.

2.2.6. Add Hazmat to the Process

There is not currently an interface to automatically populate hazardous material information in DOEHRS. This information is currently tracked in various installation level hazardous material information systems such as the Air Force Environmental Management Information System (AF EMIS), the Air Force Enterprise Environmental, Safety, and Occupational Health Information Management System (EESOH MIS), or the Hazardous Material Management System (HMMS).

BE should base the identification of hazards (discussed next) on the material used in the particular shop and processes but should not spend an unnecessary level of effort to replicate hazardous material tracking data in DOEHRS. Ultimately, DOEHRS will be updated to receive this information electronically and be able to feed control and risk data back to the identified AF system(s).

2.2.7. Identify and Add Actual/Potential OEH hazards to the Process

First off, the term "hazard" as used in DOEHRS is somewhat misleading. Typically a "hazard" indicates an unacceptable condition. In DOEHRS, a "hazard" is a broader term that simply identifies a completed pathway of exposure exists to a stressor that has the ability or potential to cause harm. DOEHRS facilitates the completion of a health risk assessment for all identified "hazards" to determine whether a hazardous or unacceptable condition exists. In DOEHRS, these potential "hazards" (chemical, physical, or biological) are tracked against the shop and process that generates the potential hazard. DOEHRS also enforces a business rule for the user to document if an ergonomic hazard exists for each process and if so, document the date the hazard started. Ultimately, the process will serve as the common thread between shops and SEGs and the hazards identified for each process will be pulled into the corresponding SEGs. There is no magic formula for which chemical exposures must be identified as a DOEHRS "hazard." In an ideal world of unconstrained resources, every stressor would be identified and the degree of risk captured. In reality, this will take some professional judgment as to the nature of potential health effects and the level of likely exposure based upon process information, documentation of similar exposure in other workplaces or professional literature. It is important to recognize the legacy data from the Command Core System (CCS) did not specifically identify the chemical stressors. Migrated data could only identify those hazards that had a migrating sample record in CCS. As such, it is expected that additional hazard identification would occur through the on-going routine surveillance schedule and as a result of the hazardous material authorization process.

2.2.7.1. Add hazards by navigating to the appropriate *Process*, expanding the node next to the process name and clicking on the *Hazards* link (Figure 12). If this is the first time a process is being evaluated for the existence of a hazard, you will have to select whether it also presents an ergonomic hazard, as noted in the previous paragraph. This is accomplished by either using the drop down menu to select yes or no, or by clicking on the *Answer Potential Ergonomic Hazard Question* icon next to it (Figure 13).

Figure 12. Process Hazards

Figure 13. The Omnipresent Ergonomic Hazard Question

2.2.7.2. If there are no ergonomic hazards, select no and save the record. If there are ergonomic hazards, select yes. Subsequently, a list of possible ergonomic hazards will display. Select the appropriate types of ergonomic hazard and the start date for each hazard. Once the selections are completed, the user will need to click the *Add to Form*. If not sure whether ergonomic hazards exist for the process, clicking on the *Answer Potential Ergonomic Hazard Question* icon will open a wizard that lists the potential ergonomic hazards descriptions accompanied by pictures. The user will answer a series of yes/no questions and press continue. Based on those answers, the wizard will provide a selection of potential ergonomic hazards that the user may select and add a start date and click the *Add to Form* button.

2.2.7.3. Once saved the user may add other chemical, physical, or biological hazards by selecting the *Add Record* icon or from the *Other Actions* drop down menu. The user is then prompted to find the *Hazard* to include by using either the quick or advance search functions. If using the quick search, select which criteria to use either the hazard name or CAS number and enter the required information. The user is presented with the results and selects the appropriate hazard and clicks *Add to Form* which takes the user to the *Hazard – Detail* page.
Note: When performing a hazard search using the CAS number, the dashes need to be included for DOEHRS to find the hazard.

2.2.7.4. Enter the start date and exposure routes for the hazard on the *Hazards – Detail* page. It is also important to relate the hazard source to each hazard. This is accomplished by expanding the *Hazard Source Information* tile and selecting the *Hazmats*, *Equipment*, or *Controls* that are associated with the process and are creating the hazard. The user will need to highlight the appropriate selections in the shuttle box on the left by clicking on them and pressing the *Add Selected* button. This action will move them to the right shuttle box. They can be removed as hazard sources by selecting them and clicking the *Remove Selected* button to move them back to the left shuttle box. The user will need to save the *Hazard – Detail* record to complete the process.

2.2.8. Add Controls to the Process
In-place Controls are tracked in DOEHRS against the Process and can be associated to the Hazard being controlled. When PPE controls are entered, the system can also track which employees in that process are assigned the control. DOEHRS enables the user to document

whether the control is *Adequate* by selecting "Yes", "No", or "Unknown." Inadequate controls should require the user to identify a shop *Deficiency* related to the particular control. DOEHRS also enables the user to identify if the control use is "Required", "Recommended", or "Elective." The logic in one DOEHRS report is inadequate to identify Certified PPE. In reality, all PPE that is answered "Yes" for being "Adequate" should be Certified PPE. Until this logic is fixed, users have to mark the control as "Recommended" for the item to show on the Certified PPE list. The report includes process PPE that is marked as Recommended although a change request has been submitted to alter this functionality to allow for PPE narrative to display regardless of what selection (Recommended, Required or Elective) is selected. The distinction between "Required" or "Recommended" is rooted in the issue of whether the medical community can "require" the use of a control or simply make a "recommendation" to the unit commander, who subsequently determines what is "required" or not. This is an arbitrary distinction and either "Required" or "Recommended" in this context means it is the BE determination that the existing, in-place control should be used to protect the worker as opposed to an "Elective Use" control which is not needed to protect the worker. Recommendations for additional controls are tracked in the SEG area of DOEHRS. The distinction between in-place controls and recommended controls should be stressed here as well. Controls that are in-place and in use to control potential hazards are tracked in the Shop and Process area of DOEHRS and recommendations to use a new control are tracked under the SEG. When a recommendation for a control is entered into against a SEG, a Deficiency should also be entered against each Shop that contains the Processes that require the change to or addition of the recommended control. The recommendation for a control will appear in the *Shop Survey Report* when generated if processes in that shop are part of a SEG where the control has been recommended and the control has been identified to that process while recommending the control.

2.2.8.1. The user may enter in-place controls by navigating to the process and selecting the Controls link (Figure 14).

Figure 14. In-Place Process Controls

2.2.8.2. On the *Controls – Search* screen, select the *Add a Control* link. The user will be prompted to select the *Control Type*, *Class*, and *Name*. Each selection filters the drop down selection below it (Figure 15). The user will choose whether the control is an *Engineering*, *Administrative* or *PPE* Type. Choose the filtered lists of *Control Classes*, then the *Control Name* (or *Mask Type* if a Respirator) and press *Continue*.

Figure 15. Control Information

2.2.8.3. The *Control Detail* page will need to be completed with details appropriate to the control type selected. The detail page is a good place to add electronic file attachments that are specific to the particular control such as manufactures design documents and instructions, previous evaluations of the control, and pictures of the control and if needed, where to perform subsequent evaluations.

2.2.8.4. *Administrative Controls Detail* page will require, at a minimum, the user to enter a description of the control, denote whether the control is adequate, if the use is required, recommended, or elective, and a start date for the controls association with the process. If the control is required, the users may select one or more of the check boxes to denote the reason. The comments field may be used to add any narratives deemed necessary. Note that multiple processes may be listed in the *Current Processes Assignment* tile. These are all processes currently active in the shop. The user may associate a control with multiple processes by entering a start date for each one. It is important to note that DOEHRS controls are not simply a "type" of control. As such, a control is assigned to multiple processes, there is actually only one control and changes to that record will be applied to all associated processes within the particular shop. Once the detail page is complete, the user will press *Continue* and select which hazards are being controlled on the next screen. After the selection or selections have been made, the user will save the record.

2.2.8.5. *Engineering Controls Detail* page will require, at a minimum, the user to enter a description of the control, denote whether the control is adequate, if the use is required, recommended, or elective, and a start date for the controls association with the process. If the control is required, the users may select one or more of the check boxes to denote the reason. The comments field may be used to add any narratives deemed necessary. The user may add additional information concerning *Ventilation System Identification*, *Make-up Air Identification*, and *Design Criteria*. If needed; the user may associate an engineering control with multiple processes by entering a start date for each one. The user may also view any former process assignments if they so choose. Again, once the detail page is complete, the user will select which hazards are being controlled on the next screen. After the selection or selections have been made the user will save the record.

2.2.8.6. PPE controls present a slightly different approach. These items require the user to enter a description of the control, denote whether the control is adequate, if the use is required, recommended, or elective, and a start date for the controls association with the process. If the control is required, the users must select one or more of the check boxes to denote the reason.

2.2.8.7. The *Narrative Description for Certification of Selection of PPE* must be completed for each PPE added. This information is used for the certified PPE list that is produced within the Shop or SEG report.

2.2.8.8. The user may associate the PPE control with multiple processes within the shop by entering a start date for each one in the *Current Process Assignments* area of the *Control Detail* page. If the control is being used in multiple processes the narrative description for the certified PPE list needs to account for the PPE potentially having different limitations for the different processes.

2.2.8.9. Once the detail page is complete, the user will press *Continue* and select which hazards are being controlled on the next screen and which personnel are assigned the PPE. After the selections have been made, the user will save the record.

2.2.9. Ventilation Systems
Although ventilation systems are typically engineering controls, each ventilation system is added separately in DOEHRS, prior to selecting a component of the system as a process control. A ventilation system is comprised of multiple components (i.e. hood/booth, duct, fan, etc.). The minimum requirement is to identify each hood/booth component in the ventilation system and as the "control" at the process level. For reference, the points of contaminant capture would be considered as a hood/booth component. Additionally, DOEHRS will let you document the layout of a system by relating the hood/booth components to related ducts, fans, and exhaust outlets. These additional components are "optional" and should likely not be identified as "controls" in addition to the hood/booth components.
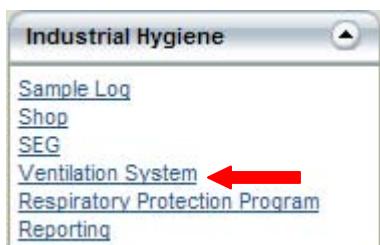
Figure 16. Ventilation System link

2.2.9.1. To add a ventilation system, the click on the *Ventilation System* link in the Industrial Hygiene menu tile (Figure 16) and select the *Add Ventilation Systems* hyperlink from the bottom left corner of the *Ventilation System – Search* screen

2.2.9.2. Complete the *Ventilation System – Detail* screen. A system name and start date are mandatory. The user will also need to identify the parent location for the ventilation system in the *Location Information* menu tile and then *Save* the record. It would be appropriate to at least

identify the Building for the location of the ventilation system. This will create the ventilation system so that components may be added. The components are the parts (i.e. hood/booth) of the ventilation system that control the process hazard. Once the ventilation system is added, the components can be added by clicking on the *Ventilation Component* link under the *Ventilation System* in the in *Industrial Hygiene* menu tile (Figure 17) and selecting *Add Ventilation Components* from the *Other Actions* drop down menu

Figure 17. Ventilation Components link

2.2.9.3. The first step is to select the *Ventilation Component Type* from the pick list. The choices are Air Cleaner, Duct, Fan, Hood/Booth, or Stack. The user will next select whether the component is a control and if the answer is yes will identify the shop the control is used in (Figure 18).

Figure 18. Add Ventilation Component

2.2.9.4. The user will complete the Ventilation Component – Detail screen by entering a ventilation system name, selecting the Parent location, entering a Start Date, designating the Shape (i.e. Round, Square or Rectangular, or Other), for certain components, and the Area in feet squared, and whether it is Supply or Exhaust. The user must designate at least one process assignment for this control. Control Information is added by selecting the Control Class and Control Name from the pick list. The user will also designate whether the control is Adequate and if the Use is Required, Recommended, or Elective.

2.2.9.5. After the mandatory information is recorded the user may also enter Design criteria. Expand the *Design Criteria* menu tile and click the *Add Record* icon (+). The user will select the Specific Criteria and Units from the pick lists. They may also enter the minimum and maximum values and designate if it *Meets Specifications* (Figure 19).

Figure 19. Design Criteria Detail

2.2.9.6. After completing the *Ventilation Component – Detail* screen, the user will click the *Continue* button to select the Hazards Controlled and if applicable, Hazards Created.

2.2.9.7. Ventilation Surveys may be scheduled thru the Master Schedule and can be accessed via the *Industrial Hygiene* menu tile under the *Ventilation Systems* link and subsequent *Surveys* link (Figure 20).

Figure 20. Ventilation Surveys

2.3. Compliance Assessments

DOEHRS currently has limited functionality related to hard coded compliance assessment checklists. First, there are a limited number of checklists available in DOEHRS. Second, DOEHRS does not have the ability to identify the applicable checklist items for a specific workplace. The current checklists available within DOEHRS are for Hazard Communication (HAZCOM), Heating, Ventilation, and Air Conditioning (HVAC) (not including industrial ventilation), Indoor Air Quality, and Respiratory Protection. In some cases, these "checklists" mix general information regarding the program and the actual inspection criteria for the program. In lieu of checklists, DOEHRS has the ability to track deficiencies against a wide variety of occupational and environmental health program requirements. This supports the BE Flight requirement to complete a Compliance Assessment as an integral part of Routine Surveillance, during the Periodic Survey. The limiting factor is that documentation of compliant programs is not specifically documented. Rather, DOEHRS tracks the non-compliant program items as a Deficiency. Ultimately, a change request should enable the association of master Deficiency items to a particular shop or process as a means to identify the applicable items. These applicable items would be pulled into a "Compliance Assessment" with ability to document compliant and non-compliant aspects of the item. Currently, DOEHRS only captures the non-compliance aspects unless there is a specific hard-coded checklist (as identified above). If local checklists are used, DOEHRS allows for these event checklists to be attached to the appropriate Shop or Process. It is critical that users fully use the Shop Deficiencies area of DOEHRS to ensure that individual items found on DOEHRS checklist items deficient are documented correctly. It is planned that future versions of DOEHRS will allow for checklist items to automatically pull deficient checklist items into a deficiency checklist. Until this enhancement can be realized, Air Force users should use either the applicable sections of the Occupational Health Protocols in the ESOH Compliance, Assessment, and Management Process (ESOH CAMP) or use the list of DOEHRS Deficiencies as their source of checklist information. Regardless, every effort must be made to link checklist items to the DOEHRS Shop Deficiencies. Any non-compliant program areas, as identified by whatever checklist is use in the field, must be documented within the *Shop>Deficiencies* area of DOEHRS (Figure 21. Deficiencies). Follow-ups to compliance assessments may documented in the *Observations and Notes* section for the affected shops.
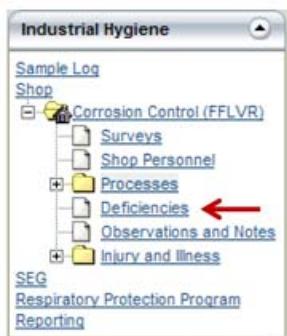
Figure 21. Deficiencies

2.3.1. Add a deficiency by clicking the "*Add Record*" icon (+) or by selecting Add a Deficiency from the *Other Actions* drop down menu.

2.3.2. Select the *Process* within the shop that have the deficiency and continue.

2.3.3. Select the SEGs that are affected by the deficiency and continue.

2.3.4. Enter the Deficiency details by selecting the *Deficiency Category* and *Deficiency Type* (e.g. Hazcom and Training: Inadequate information & training to handle spills/leaks), along with any additional description and reference comments.

2.3.5. Deficiencies must have a Risk Assessment Codes assigned. This is accomplished by clicking on the view available selections icon. A pop-up window will allow the user to select the RAC type (Figure 22**Error! Reference source not found.**).
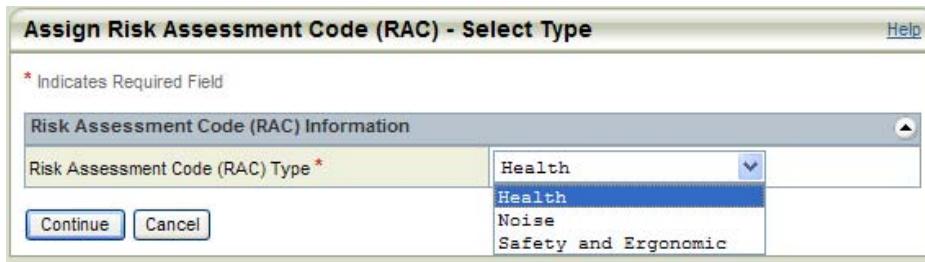
Figure 22. RACs

2.3.6. Complete the risk assessment code screens that follow by selecting the appropriate choices to identify exposure conditions, medical conditions, exposure duration, and number of workers exposed. The calculated RAC will populate the text field.

2.3.7. Enter a start date for the deficiency and any other information pertaining to recommendations.

2.4. Similar Exposure Groups (SEGs)
As part of basic characterization, Similar Exposure Groups (SEGs) will be created to group similarly exposed personnel for industrial hygiene assessments. At this point, personnel have been associated with an organization, their shop, and their processes. The last step is to ensure personnel are associated with at least one, but potentially more Similar Exposure Groups (SEGs). The SEG is the only area in DOEHRS where personal samples, exposure assessments, recommendations for additional or modified controls, and medical surveillance recommendations are made and assigned to personnel. SEG assignments are critical. Without them, no exposure data will be associated with a workers history, which is a primary requirement.
Note: Personnel may move in and out of SEGs depending on their current work assignment. This includes deployments that may dramatically change the nature of exposures to the worker. It is vitally important that personnel are correctly associated with the SEGs that represent their work assignments. If SEG assignments are not properly managed, personnel will not have the longitudinal exposure data that is required by Presidential mandate.

2.4.1. Create a SEG

DOEHRS allows a SEG to be created for the people performing one or more processes and can cross shops to the degree exposure data can be determined to be similar enough such that the measurement (sample) of any one worker is indicative of the exposure to all members in the SEG (population). Some examples to illustrate the power of the SEG in exposure assessment include:

- A wing has four separate F-16 squadrons. While each one needs to considered a separate organization, with their respective subordinate shops, it is likely the crew chief exposure in the flightline shops would be similar enough for exposure to noise, fuel, and combustion by-products. These exposures can be collectively assessed in a single SEG should environmental factors and workload be similar enough to form an initial hypothesis that the exposures are similar. As data is collected, this hypothesis can be tested.
- Everyone uses 16 ounce cans of spray paint. Virtually every shop has a can of paint for whatever toolbox, locker, desk, or floor marking they wish to make. It would be possible to include all of these similar processes in a SEG, possibly making a distinction between spray painting indoors, spray painting outdoors, and spray painting with a local exhaust ventilation system.

DOEHRS allows the user to view the processes that are being considered for the SEG side by side in relation to the potential Hazards offered by the respective SEGs. All shop processes that have an identified hazard must be part of a SEG in order for an IH Assessment to be performed.. Ultimately, **all potential Hazards must have an assessment**. SEGs at this stage may be very fluid and dependent upon further evaluation in order to best determine affected exposure groups and potential exposures. It cannot be stressed enough that without a SEG assignment and a completed assessment, exposure level data will not be attributed to the SEG workers or added to their Worker Exposure History Report. Without this action, it is not possible to accurately maintain a longitudinal exposure record for each worker, which is one of the main enabling capabilities of DOEHRS. Users may create a SEG by navigating to the *Industrial Hygiene* menu and selecting the link for the *SEG* (Figure 23).

Figure 23. SEGs

2.4.1.1. To create a SEG, click on the *Add SEG* link on the bottom on the *SEG – Search* screen.

2.4.1.2. The second step is to select the *Process* or *Processes* from the search list to add to the SEG. Use any combination of UIC, UIC Name, Shop Name, Process Name, Process Category, Common Process, or Method as criteria to search for processes. Remember that a SEG will require at least one process.

2.4.1.3. Step three allows the user to refine the process selections by either the associated hazards or by the personnel in the processes. If the user chooses to refine the SEG they will be presented with screens that show all the hazards and personnel assigned to the processes. **The user should ensure workers included in a given SEG share the fact they all perform the same processes and are anticipated to have similar exposure.**

2.4.1.4. When establishing a SEG, the user will have the opportunity to view all personnel who are assigned to the processes that have previously been selected to make up the SEG . The user has another opportunity to include or exclude personnel from membership to the SEG if desired. The user may edit the SEG membership at any time by navigating to the SEG and clicking the *Add Record* icon at the SEG Personnel Assignments tile.

2.4.1.5. The last step is to complete the *SEG – Detail* page with the name of the SEG and the *Start Date*. Though not mandatory, the SEG description and comments fields should be used to document the rationale used to determine which processes would be included in the SEG.

2.4.1.6. New processes and personnel may be added to an existing SEG by navigating to the *SEG – Detail* page and clicking the *Add Record* icons for the *SEG Processes* or *Personnel Assignments* menu tiles. This is how processes from other shops can be searched for and ultimately added to an existing SEG.

2.4.2. SEG IH Assessments
The foundation of DOEHRS is the ability to conduct a Health Risk Assessment on each hazard, for similarly exposed personnel. ***Ultimately, all hazards entered into DOEHRS under a shop and process must be included in a SEG IH Assessment.*** As a reminder, migrated data from legacy systems only included chemical hazards if there was a migrating sample record. Additionally, no assessments were migrated given the need for chemical specific assessments in DOEHRS and the inclusion of a more enhanced suite of assessment tools. Early in the Routine Surveillance history of a given shop, ***BE Flights will need to identify additional process hazards*** and may have only qualitative information with little or no sampling data. ***An IH Assessment is still required for the hazard and should be a starting point in which the assessment will continue to be defined over time.*** As more detailed information becomes available through quantitative sampling and surveys, assessments should be better defined using TWA results from sampling. This would ultimately increase the confidence in the exposure characterization. Special Surveillance information should be used as a tool for the continuous update of IH Assessments for hazards entered into DOEHRS. Each IH Assessment includes information regarding the need for additional data, as well as the Exposure Assessment Priority (EAP). For each IH Assessment requiring additional data, or for any other recurring exposure assessment requirements, a Master Schedule sampling task should be created. The EAP will be used to assist the IH professional in prioritizing special assessment tasks in the Master Schedule.

Unfortunately, the EAP is currently not displayed on the Master Schedule screen. When conducting SEG IH Assessments, ***DOEHRS users must complete the factors that calculate the Exposure Assessment Priority (EAP).*** The EAP determination is based, in part, on the "Confidence in Existing Controls" and the "Confidence in Hazard and Exposure Characterization." The EAP number will range from 1-125 with 125 representing the most serious side of the range. EAPs can be calculated whether performing a qualitative or quantitative assessment. Figure 24 depicts the integration of the factors and weightings used to calculate the EAP. The EAP indicates the IH's potential priority for collecting information and using the ORM-based course of action. If the IH has collected sufficient information, then the EAP would indicate a low priority even in situations where the ORM would indicate high exposure to toxic substances.
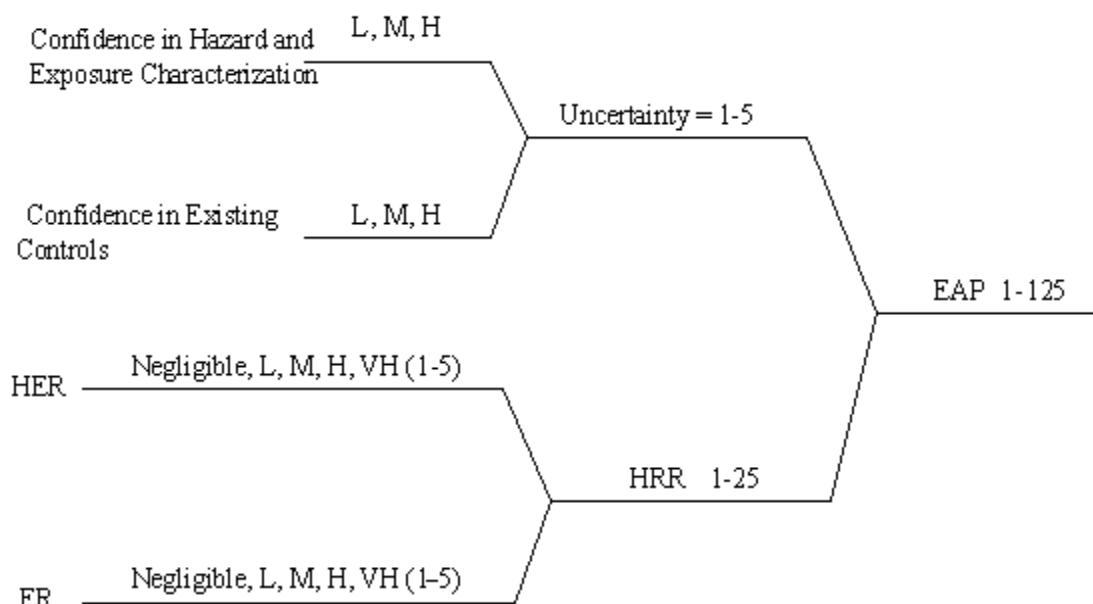
Figure 24. EAP Algorithm

Confidence in OEH exposure characterization answers the question: "Do I have enough data to make sound, health risk-based conclusions regarding exposure?" Consider the completeness of quantitative data, variability of sampling results, and appropriate application of professional judgment in determining confidence in hazard characterization. Table 1 provides some guidance to assist in the decision regarding confidence in the exposure assessment.

Table 1. Confidence in Hazard Classification

Classification	Description
Low	Conclusion regarding potential health outcome is **<u>based solely upon</u>** a qualitative OEH exposure assessment; no quantitative data available. Hazard determined to potentially generate exposures at level of concern based solely on applying professional judgment.
Medium	Conclusion regarding potential health outcome is based upon detailed OEH exposure assessment **<u>and/or</u>** application of professional judgment. Screening or initial sampling results indicate exposure may be controlled, but data are not sufficient to make a final conclusion.
Medium	Conclusion regarding potential health outcome is based upon use of representative USAF and/or private sector information/data.
High	Conclusion regarding potential health outcome is based upon detailed OEH exposure assessment **<u>and</u>** application of professional judgment. Sampling results indicate exposure is controlled; further characterization not required.
High	Conclusion regarding potential health outcome is based upon a sound exposure estimate which concludes the source of the OEH hazard does not have potential to generate exposure at a level of concern, e.g., soldering with low thermal-output irons.

Confidence in controls is determined by assessing the effectiveness of existing OEH hazard controls compared to measured or estimated exposure. Table 2 provides some guidance to assist in determining the confidence in the existing in-place controls.

Table 2. Confidence in Hazard Controls

Classification	Description
Low	Controls inadequate.
Low	Controls in poor state of repair/non-operational/not actively used.
Medium	Administrative controls and/or PPE used; exposure is adequately controlled when procedures are employed and/or equipment is used properly.
High	Engineering controls/administrative controls in place and evaluation demonstrate exposure is under control.

2.4.2.1. Create IH Assessment Definitions

To perform an IH Assessment in DOEHRS the user must first define what hazards will be assessed as part of the IH Assessment. This is done by creating an IH Assessment definition. To perform an IH Assessment, the user will navigate to the appropriate *SEG*, expand the node next

to *Assessments*, and select the *IH* link (Figure 25). This will open the *IH Assessments* page. On this page, users may view previously completed assessments or Add Assessment Definition by clicking the *Add Record* icon or using the drop down menu.
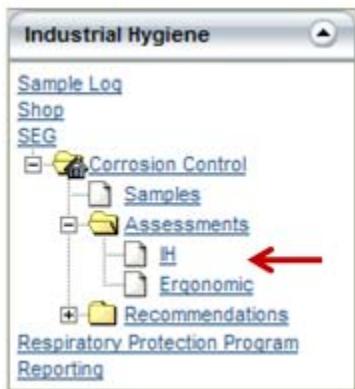
Figure 25. IH Assessment

2.4.2.1.1. The first step is to select the IH hazard. The user will be presented with the hazards currently associated with the SEG from the assigned processes.
Note: There are tabs across the top of this screen that are used to select the hazards associated with exposure routes of ingestions, inhalation, skin absorption, skin and/or eye contact, and physical hazards. Ensure the correct tab is chosen prior to selecting the hazard or hazards to be included in the assessment definition.

2.4.2.1.2. The second step requires the user to select the processes to include in this assessment. The list will include all currently assigned processes for the SEG. **It is important to understand how each SEG performs the work scheduling to determine how best to group hazards in an assessment.** For example, heavy metal exposure from paint removal and primer application can result from either sanding all-day, priming all-day, or some combination of sanding and priming throughout the day. The IH Assessment must ultimately group similar process exposures into a single conclusion. At least one process is required to complete the assessment, but again, you must account for all exposure to a given hazard during the work day.

2.4.2.1.3. The third step is to select the Occupational Exposure Level that will be used for the assessment. A list of OELs will be available for selection. It is possible to select no OEL for this hazard or select an adjusted OEL if needed to account for extended workshifts. The OEL time periods must be the same for inclusion in a single assessment. The user will click the *Define Assessment* button and be taken back to the *IH Assessments* page. The newly created *Assessment Definition* will now be visible.

2.4.2.1.4. Once an *Assessment* is defined, the *Assess* button will need to be selected in order to begin the assessment. The Assessment will be either a Qualitative or a Quantitative Assessment depending on the type of data available.

2.4.2.2. Qualitative IH Assessment
Some exposures can be assessed without the need to collect additional sampling data locally. For example, a Technical Report or a published Journal Article may indicate a study was completed with 522 samples to assess the exposure to jet fuel vapor and benzene during operation of fuel trucks on flightlines at 10 separate AF installations. The study concluded a particular exposure level and a degree of confidence. It is certainly possible to apply professional judgment to qualitatively "assess" the local exposure based upon comparison of work practices and environmental condition present locally. In such an example, a Qualitative Assessment would be most appropriate. A qualitative assessment may also be performed if there is insufficient data for statistical calculations for use in either of the other options. The qualitative assessment enables the user to apply process knowledge and professional judgment to a potential hazard. The main purpose for performing a qualitative assessment is when there is a shop or processes that have not been quantitatively assessed with local sampling data. You must still decide if the controls in place are appropriate and identify the need for additional sampling to increase your confidence in that decision.

2.4.2.2.1. The qualitative option will be used to perform the initial risk assessment and provide an exposure assessment priority (EAP) score as well as to identify that more data may be required. To perform a qualitative assessment, select the *Definition* on the *IH Assessment* page and then click the Assess link for the appropriate IH definition and select the *Perform Qualitative Assessment* button in Step 1.

2.4.2.2.2. Enter a start date and identify whether the exposure evaluation indicates whether the exposure is acceptable of not. The user may choose to enter an exposure level if one is known as well as comments concerning the exposure assessment rationale and whether more data is required. The comment field may be used to elaborate on the basis of the determination. This could include reference to other sampling, detailed exposure assessment reports published elsewhere, the results of exposure modeling, or other specific reference as to the basis of the professional judgment.

2.4.2.2.3. Regardless of the conclusion regarding exposure acceptability, the BE Flight must assign an Exposure Assessment Priority. This is accomplished by clicking the *View Values* icon next to the text field, which will bring up a three-step decision logic chart that will walk through the user through the EAP algorithm.

2.4.2.2.4. Based on the outcome of the routine surveillance and the IH Assessment, special surveillance may be necessary to complete the evaluation of the occupational risks. ***For assessments where there is low confidence in the exposure assessment or where the need for additional data is documented, follow-on sampling and assessments should be generate a master schedule sampling task.***

2.4.2.3. Quantitative IH Assessment
When local sampling data exists, it is possible to conduct a Quantitative IH Assessment. In order to apply the statistical tools embedded in DOEHRS, at least six samples must be entered. It is possible to perform a quantitative IH Assessment on One Sample, but this is not necessarily a

preferred practice. A future change request will ultimately enable the inclusion of one to five samples in an IH Assessment but ultimately, the exposure classification is more qualitative in nature given the need to apply professional judgment in the interpretation of the limited sampling data.

2.4.2.3.1. The first step is to select the samples that will be used for the assessment. There are tabs across the top of this screen that denotes which samples are available for selection. Ensure the correct sample tab is selected for use. For chemical hazards, the user will need to use the Air Breathing Zone samples that have been used in a TWA calculation on the Air Breathing Zone tab. An error in DOEHRS will cause raw samples to be included in the list in addition to their TWA. Ensure the samples selected have the same unit of measure and do not mix TWA samples with raw samples. If time-weighted average results are available, select those rather than the raw samples. Also, make sure a single sample was not included in more than one TWA as this situation has been identified for at least one base attempting to incorporate multiple TWA results in an assessment. Obviously, only one TWA for a single worker day set of samples would be appropriate. Once the samples have been selected, the user may calculate statistics. At a minimum, six samples are required to use the *Calculate Statistics* button. If multiple consecutive samples are used for one TWA, then that is considered one sample in DOEHRS.

2.4.2.3.2. To calculate statistics, select at least six TWA samples and click the *Calculate Statistics* button. The next screen will require the user to select the type of statistics to calculate. There are two tabs at the top of the screen. The statistics will either be calculated as normal or lognormal distributions. Typically, IH sampling will have a lognormal distribution and should be selected. The W-Test will state whether the distribution passes verification. The user may press the Calculate All Statistics or Calculate Selected Statistics if the user prefers to do so.

Perform Assessment - Step 2 of 4 - Calculate Statistics		
Normal Distribution Statistics		Lognormal Distribution Statistics

Select the statistics to calculate.

SEG Name: Class SEG Hazard: ANTIMONY Process(es): STW Welding SMAW, wbWeldingSMAW, GTN Welding SMAW, LRCWelding SMAW, YAJ WELDING SMAW, RJE Welding SM hr TWA OEL value: 0.5 mg/m3

Cancel

Lognormal Distribution Statistics

Calculate All Statistics   Calculate Selected Statistics

Select	Statistic Name	Statistic Type
	W-Test of Data (a = 0.05)	Distribution Verification
☑	Number of Samples (N)	Descriptive
☑	Maximum	Descriptive
☑	Minimum	Descriptive
☑	Range	Descriptive
☑	Percent Exceedance (of OEL)	Descriptive
☑	Arithmetic Mean	Descriptive
☑	Arithmetic Standard Deviation	Descriptive
☑	Geometric Mean	Descriptive
☑	Geometric Standard Deviation	Descriptive
☑	MVUE of the Mean of Lognormal Distribution	Parametric
☑	UCL (1, 95%) of the Arithmetic Mean (Land's Exact)	Parametric
☑	LCL (1, 95%) of the Arithmetic Mean (Land's Exact)	Parametric
☑	Exceedance Fraction (% > OEL)	Parametric
☑	95th Percentile	Parametric
☑	95 ˅ % UCL 95 ˅ percentile	Parametric

Calculate All Statistics   Calculate Selected Statistics

Figure 26. Statistics

2.4.2.3.3. The third step is to select the exposure level. This screen returns the results of the statistical calculations and the user will select the appropriate choice and click the *Assign Exposure Level* button.

2.4.2.3.4. The last step of the assessment is to review the OEL, Action Level, and Exposure Level assigned to this assessment. A start date must be entered for this assessment. If the exposure level exceeds the OEL, the user should most certainly select Unacceptable for the Exposure Evaluation. Even if the OEL is not exceeded, the user may find it worthwhile to choose the exposure evaluation of unacceptable. There could be many reasons for doing this but likely it is because there is a lack of confidence in the overall evaluation. The user may also determine the evaluation needs more data and can identify that by checking the appropriate box.

Exposure Assessment

* Indicates Required Field

SEG Name: Corrosion Control Hazard: TOLUENE Process(es): Aircraft Painting

Save Cancel Reassess

Assign Exposure Level

OEL	188.0 mg/m3
Action Level	94.0 mg/m3
Exposure Level	37.5 mg/m3
Start Date *	2009/04/20 (yyyy/mm/dd)
Stop Date	(yyyy/mm/dd)
Exposure Evaluation *	○ Acceptable ⊙ Unacceptable
Need More Data	☐
Mark as Invalid	☐
EAP (Required if Exposure Evaluation is Unacceptable)	9
Exposure Evaluation Rationale *	Based on One Sample
Exposure Assessment Rationale Comments	

Program Office Information

Save Cancel Reassess

Figure 27. Exposure Assessment

2.4.2.3.5. If an exposure evaluation is deemed to be unacceptable, the user will have to assign an Exposure Assessment Priority (EAP) score. *Regardless, an EAP must be calculated for all hazard assessment.* This is accomplished by clicking the *View Values* icon next to the text field. This will bring up a three-step decision logic chart that will walk through the user through the EAP algorithm.

2.4.2.3.6. The EAP considers the operational health risk of the process using Severity and Probability. EAP calculates hazard severity and probability during the health effect rating in step

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1 of 3 and the Exposure Effect Rating in Step 2 of 3. Step 3 of 3 considers the confidence in hazard and exposure characterization, and confidence in existing controls. Every assessment must have a calculated EAP, regardless of the acceptability of exposure or the need for additional data collection. For assessments where there is low confidence in exposure assessment or where the need for additional data is documented, follow-on sampling and assessments should be scheduled through the master schedule functionality. If exposure levels are entered, step 2 of the wizard is skipped. If no exposure level is entered, the system will default the exposure effect rating (Step 2 in the wizard) to very high.

2.4.2.3.7. If there are not six samples the user may still perform a quantitative assessment. The user will select one sample and click the Perform Quantitative Assessment on One Sample. The resulting steps are identical as described in the previous paragraphs with the difference being that the calculate statistics page in not used.

2.4.3. Create WMP Sampling Tasks
After assessments have been completed, determine whether more sampling is needed to further characterize the SEG exposure. Selecting the sampling task to schedule may be started from the *SEG IH Assessment* page. The user may select the radio button next to the appropriate assessment and clicking the *Create WMP Sampling Task* button.

Figure 28. WMP from IH Assessments

2.4.3.1. The *Master Schedule* is used to create and schedule program office sampling and survey tasks. These tasks may be scheduled as one time or recurring frequency tasks and will notify the user when the task is due. Master Schedule tasks are created for shops and SEGs.

2.4.3.2. The *Workplace Monitoring Plan (WMP)* is a sub-set of the *Master Schedule* and is used to create and track industrial hygiene sampling tasks. IH sample tasks may be viewed by using the *Search* function for the *Master Schedule* and selecting criteria pertaining to the WMP. The *Other Actions* drop down menu provides several options to search for and view workplace monitoring plan tasks.

2.4.3.3. *Master Schedule* tasks are accessed via the *Work Plan>Master Schedule* link. Users may search for active and archived tasks from the *Master Schedule – Search* screen. Unlike other search screens within DOEHRS, users must enter at least one search criteria to perform a search.

Users may search for tasks by *Shop*, *Shop Priority*, *Regulation*, or *Location Name*. Users may also search via *Task Type*, *Assigned Program Office Personnel*, or *a Projected Task Start Date* range.

2.4.3.4. Tasks may be added from the *Add Master Schedule Tasks* link located on the bottom left corner of the *Master Schedule - Search* or the *Add Record* icon and *Other Actions* drop down menu on the search results screen.

2.4.3.5. When creating a WMP sampling task, select the task type *Sampling – IH* and then the sampling method.

Figure 29. Creating Sampling Tasks

2.4.3.6. The next steps require the user to search for and select a *SEG*; select a *Shop* and identify which *Processes* the sampling is for; the *Hazards* to be sampled; and the S*ampling Method* to be used.

2.4.3.7. The user will complete the sampling task by completing the *Master Schedule – Detail* page. The user will enter a *Task Frequency*, *Projected Start Date*, and *Number of Personnel to Sample* at a minimum. However, they may enter *Projected Due Dates*, Number *of Days to Sample*, *Regulation Information*, *Personnel Assignments*, and *Task Equipment*. Costs associated with the sampling tasks may also be entered on this screen. The functionality was specifically designed so that sampling tasks could be created, but NOT immediately assigned to a person with a Projected Due Date. The intent is for the BE Flight to evaluate available resources and focus resources on the sampling tasks with the highest EAP at a point in time. As the list of sampling tasks evolves over time, it may be that only tasks with EAP scores greater than 100 are able to be accomplished. **The focus should be the assignment of available resources to the highest risk tasks.**

2.4.3.8. The tasks will become part of the *Master Schedule*, *Workplace Monitoring Plan* and will also generate a workbasket notification for the assigned personnel (Figure 30).

Figure 30.Work Basket

2.4.4. Medical Surveillance Recommendations
Medical surveillance recommendations in DOEHRS simply identify that workers either fit a particular job series or that the BE Flight has determined an exposure to a particular hazard above the identified action level. The decision to perform medical surveillance and the scope of such surveillance is made by the Occupational and Environmental Health Work Group (OEHWG). Medical surveillance recommendations may be created by selecting the appropriate *Assessment* and clicking the *Make Recommendation* button.

2.4.4.1. Select the *Recommendation Type* of *Medical Surveillance* (Controls will be discussed later) and press *Continue*.

2.4.4.2. Select whether this recommendation is for a *Medical Surveillance Certification Program* or not. If the user selects "yes", the next step is to select the specific certification program (firefighter, child care worker, etc) from the drop-down menu, enter a start date and press save. If "no" was selected, the user will select the appropriate hazard (lead, toluene, etc) from the drop-down menu, enter a start date, and press save.

2.4.5. Recommending Controls
Provide control recommendations, as necessary. Control recommendations are entered against a SEG when the existing in-place, shop process controls are not adequate for worker protection or when it is more appropriate to apply the hierarchy of controls to eliminate the need for Personnel Protective Equipment. As an important reminder, this is entirely different than documenting an existing in-place control as being of recommended use or required use. ***Whenever a new Recommended Control is identified, and that control is not an existing in-place control for a shop or process, a Deficiency must also be entered against all related shops***. Deficiencies and the associated Risk Assessment Code are the mechanisms to highlight the need to implement new controls to the shop's Chain-of-Command. It is appropriate to follow-up on the status of implementation of the *Recommended Control* in each shop, documenting such follow-up in *Observation and Notes*. ***Once the new control has been implemented, the Deficiency Status should be updated to show "Accomplished/Installed," the Deficiency should be closed and the new control must be entered as the appropriate Shop Process In-Place Control.***

2.4.5.1. Engineering, Administrative, and PPE Controls may be added by selecting the appropriate *Assessment* and clicking the *Make Recommendation* button. First select the *Recommendation Type* of *Control* and press *Continue*.

2.4.5.2. The next step will require the user to select the *Control Type*, *Class*, and *Name*.

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2.4.5.3. Complete the required information for the *Control – Detail* screen. The *Process* tile will allow users to select all of the processes within the SEG the recommendation applies to. *Attachments* pertaining to the control or the recommendation may be entered on the detail page as well. Press the *Continue* button once the detail page information is completed.

2.4.5.4. The last step is to identify the *Hazard* or *Hazards* being controlled by selecting from the list and pressing the *Save* button.

2.5. Communication

2.5.1. Shop Survey Report
Communicate the findings of routine surveillance by creating reports to provide information to the shop supervisor, providing a summary of significant issues to the unit commander as appropriate. DOEHRS provides the ability to export summary information used in support of a routine or special assessment. A short cover memo should be written, referencing appropriate attachments generated or modified via export from DOEHRS. For routine reports, the written report should summarize the purpose of the visit, timeline, individuals performing the visit, key contacts, any important information worth highlighting, and recommended courses of action. The DOEHRS *Survey Report* is designed to retrieve records that were active during the date range selected. The dates used for a routine assessment report should be selected based upon a similar start and stop date at a point in time at which all data updates have been completed to avoid the inclusion of any information that had been ended or edited during the period of the actual survey. If the user does not want to include stop dated records, the start date and end date may be the same date the report is run. Survey reports should include:
- Shop Demographics
- Assessment Summary
- In-Place Controls
- Recommended Controls
- Certified PPE
- Deficiencies
- Required IH Sampling
- Discretionary IH Sampling

The *Survey Report* is found under the *Reporting* link in the *Industrial Hygiene* menu area (Figure 31).
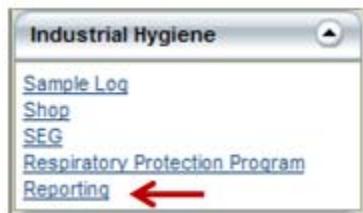

Figure 31. Reporting

2.5.1.1. Select the *Create Survey Report* link (Figure 32) and complete the seven-step process to identify the report contents. The first step is to search for the organization/UIC. The quickest way to do this is to first find the shop within DOEHRS before creating this survey report and note the UIC (all shops are tied to UICs). Then on this step type in the UIC. It simplifies the search to only one possible answer.

Figure 32. Survey Report

2.5.1.2. Step two is to select the radio button next to the appropriate UIC and continue.

2.5.1.3. Step three requires the user to select the shop or shops to be included on the report.

2.5.1.4. The user will enter a report date range in Step four. Remember the data range pulls all active records during the range entered. For the routine survey report, it is best to select identical dates that are after the completion date for all record updates.

2.5.1.5. In step five, the user will select the process or processes to include in the report.

2.5.1.6. The user selects the sample types to include in step six. Only sampling that has been associated to the processes or connected SEGS will be available to choose from. It is not necessary to provide individual sample results to the shop supervisor each year as part of the Routine Survey.

2.5.1.7. Step seven is where the user defines the data types that will be included in the generated report. The user may select Shop Demographics, Assessment Summary, In-Place Controls, Recommended Controls, Certified PPE, Deficiencies, Required IH Sampling, and Discretionary IH Sampling. While it is possible to also select Product Usage, Observations and Notes, Sample Results, Medical Surveillance, Carcinogen and Reproductive Hazards, it is not required for communication of routine survey results to a shop supervisor. Carcinogen and Reproductive Hazards are excluded only because they are currently limited to the various "codes" and are of little value to the shop supervisor without clarification as to what an "A5" actually is.

2.5.1.8. After entering all selections, the *Generate Survey Report* button will return the report with the option to export. The report will export as a Rich Text Format (RTF) which will maintain the formatting of the report. This file will be called *SurveyReport.rtf*. It is prudent to rename the file to something more specific to the contents of the report prior to saving. The report may be opened in Microsoft Word and edited as necessary. A copy of the final report to the shop should be uploaded into DOEHRS as an attachment to the appropriate shop by importing the document under the appropriate *Survey* link for that particular Shop.

2.5.2. Shop Survey Closing Conference
A closing conference should be conducted with the shop supervisor to review the findings and recommendations from the Routine Survey. The details of the closing conference should be documented in DOEHRS by making an entry into the *Observations and Notes* section under the particular shop.

2.5.3. Closing the Master Schedule Survey Task
Once the closing shop survey report has been delivered and the closing conference is complete, the Master Schedule task should be closed and a copy of the survey report imported into DOEHRS.

2.5.3.1. Under the *Master Schedule* link in the *Work Plan* menu area, search for the *Shop* and the task type of *Periodic Survey*.

2.5.3.2. Select the *Periodic Survey* link and enter the *Close Date* and verify the appropriate task frequency for the shop priority as this will automatically schedule the next Periodic Survey.

2.5.3.3. Hit the *Save* button.

2.5.3.4. Navigate to the *Shop* record, expanding the tree to view the *Survey* link. Under the *Survey Report Column*, select the *Import* link to import the finalized survey report.

2.5.4. Occupational and Environmental Health Working Group (OEHWG)
A combination of the *Shop Survey Report* and the *SEG Report* provide an excellent means of communicating the SEG risks to the OEHWG. DOEHRS can generate data superior to that previously identified for the venerable AF Form 2755 (now obsolete). Fundamentally, the *SEG Report* contains the data necessary to communicate SEG risk to the OEHWG; however we still review our exposure data based upon Shops. As such, start with the *Shop Survey Report*, as recommended above, but it would be appropriate to add the *Carcinogen and Reproductive Hazard Information* given the BE Flight representative will have the ability to explain/clarify the "codes." And then use the appropriate *SEG Reports* (for those SEGs that intersect with the particular shop) to hone in on the people when Medical Surveillance is suggested. For the *SEG Report*, it would be appropriate to select the *SEG Demographics* and *Personnel* for inclusion in the report and to compliment the data in the *Shop Survey Report*. The *SEG Report* is very similar to survey reports with the main exception being that a SEG may cross Organizations/ UICs through the process associations. To create this report, the user will select the *Create SEG Report* link (Figure 33)
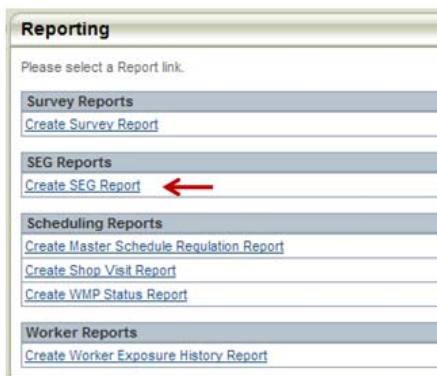
Figure 33. SEG Report

2.5.4.1. The first step is to search for the SEG.

2.5.4.2. In step two, choose one or more SEGs to include.

2.5.4.3. Enter a report date range in Step three, again keeping in mind how DOEHRS selects records for inclusion in these reports. For current data, it is suggested to use the current date, after all updates have been made.

2.5.4.4. Sample types are available in step four; however, it is not likely necessary to include every individual sample result when you otherwise have the assessment data available.

2.5.4.5. Step five is where the user defines the data types that will be included in the generated report. Just like the Survey Report, the user is presented many options; however, it is again suggested that only the SEG Demographics and Personnel would be needed to compliment the Shop Survey Report data.

2.5.4.6. After entering all selections, the *Generate SEG Report* button will return the report with the option to export as described previously. By default, this file will be called *SEGReport.rtf*. It is prudent to rename the file to something more specific to the contents of the report prior to saving. The report may be opened in Microsoft Word and edited as necessary.

2.5.5. Worker Longitudinal Exposure Record

Previously, the AF Form 2755 was placed in shop worker medical records to make exposure information available for the clinical health care provider should such data be relevant in the evaluation of a patient that presents for treatment. The DOEHRS Worker Exposure History Report contains the longitudinal exposure record for an individual. An interface with AHLTA is in the works to make the DOEHRS exposure data visible with in a window of AHLTA. Given the reliance on the electronic medical record, it is unlikely a "paper" replacement to the AF Form 2755 would be readily available to the clinician at the point of encounter. Until the AHLTA interface is functional, it is recommended to educate primary care providers on procedures to obtain worker exposure data from the BE Flight should the need for such data be deemed necessary for the diagnosis of illness. The DOEHRS Worker Exposure History Report will

actually prove more valuable than the previous AF Form 2755 in that it will encompass all documented exposures rather than simply a snapshot in time.

2.5.5.1. Navigate to the *Reporting* link under the *Industrial Hygiene* menu and select the *Create Worker Exposure History Report* link. Enter the search criteria to locate the appropriate worker.

2.5.5.2. DOEHRS will retrieve a list of workers matching the search criteria. Select the appropriate record and hit the *Generate Worker Exposure Report* button. This report can be exported similar to any other DOEHRS report.

3. Air Force Exposure Assessment Model - Special Surveillance

After the routine surveillance and risk assessments have been completed the next step is to execute special surveillance based upon the prioritized EAP. Priority should be based on the level of risk associated to the hazard through the EAP score from the IH Assessment that was previously completed. Special surveillance tasks are scheduled through the Master Schedule. Once scheduled, IH sampling tasks become part of the Workplace Monitoring Plan (WMP). DOEHRS manages schedule and suspense information for tasks required by routine and special surveillance. The Master Schedule manages recurring and one time task scheduling. There are some special assessment tasks required by the Air Force that are not currently available in DOEHRS for the Master Schedule. These tasks will be scheduled/managed using the current management process until the DOEHRS change request is implemented.
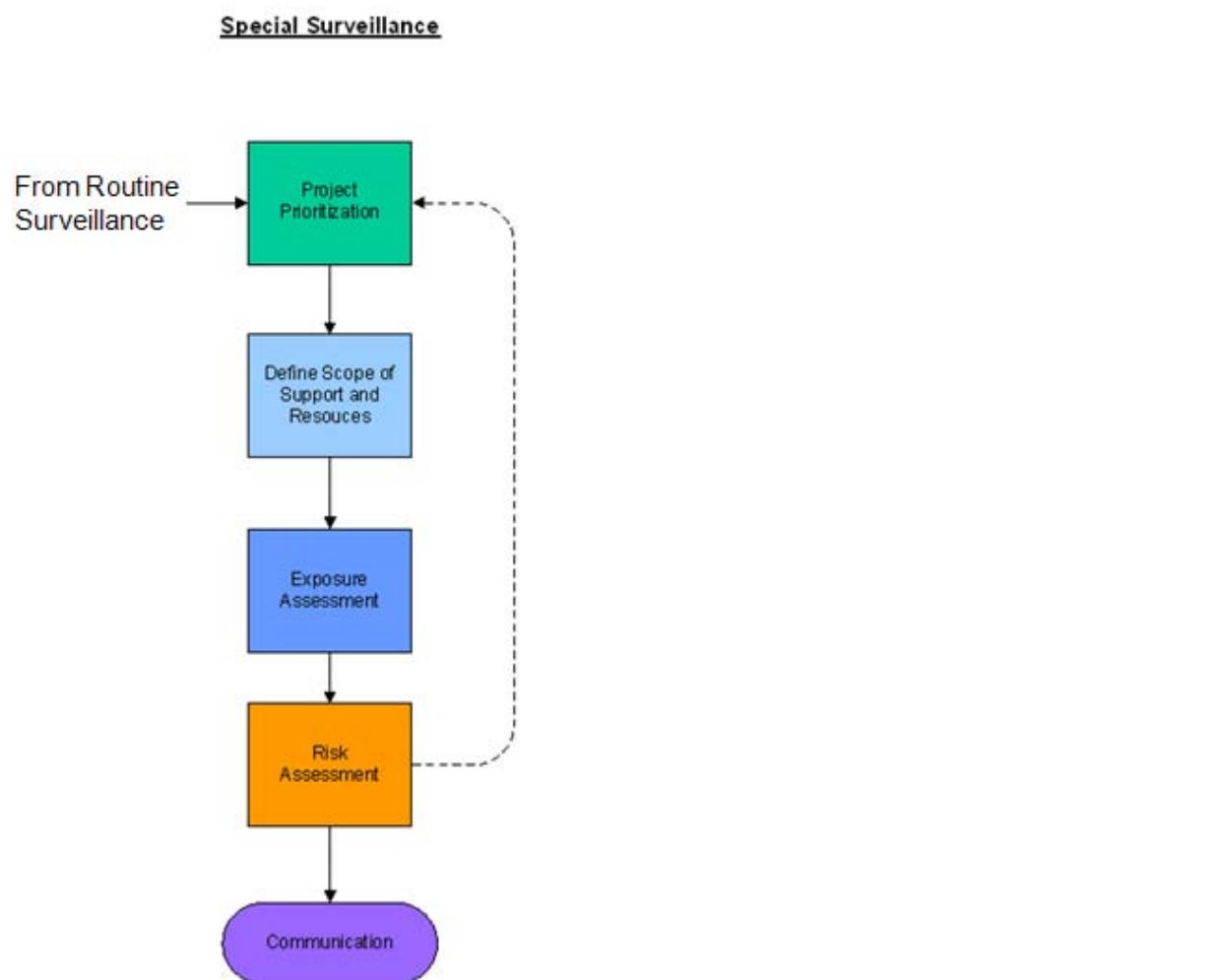

Figure 34. Special Surveillance

3.1. Project Prioritization.

Project Prioritization has more recently been referred to as "Risk Reduction Strategies" although AFI 48-145 retains the previous terminology. The key point is that the "projects" are BE Flight actions to increase confidence in the exposure characterization or confidence in the controls. The actions typically involve the collection of additional samples, measurement of control effectiveness, or more frequent monitoring of procedures. The EAP scores that were generated during the IH Assessment are essential to the scheduling and prioritization of the sampling tasks. Currently, the Master Schedule does not display the EAP so it is not as simple as it should be to allocate resources (schedule with a due date and assign personnel to the task). Existing Discoverer workbooks can be used in conjunction with each other to ensure IH Assessments "needing more data" or those concluding "less than high confidence" in the exposure characterization are appropriately entered into the Master Schedule. Additional Discoverer workbooks will ultimately combine the EAP with the sampling tasks to facilitate the appropriate selection and prioritization of Master Schedule sampling tasks required under Special Surveillance.

For sampling tasks that have been loaded in the Master Schedule, hazards and EAP scores can be obtained by generating the *WMP View (Sampling Tasks)* from the Master Schedule. Once a *Sampling – IH* task is added to the *Master Schedule* it can be assigned a *Projected Due Date – Internal*. This *Projected Due Date – Internal* should be assigned based upon the priority (EAP) and the availability of BE Flight personnel to accomplish the task. Currently, only *Master Schedule*, *Sampling – IH* tasks with a *Projected Due Date – Internal* entry will display in the *WMP Status Report*. This allows the BE Flight to identify all requirements for additional data, but only schedule those with the highest priority using available resources.

3.1.1. Once a Master Schedule Sampling Task is scheduled, the Workplace Monitoring Plan (WMP) has a column that lists the hazards and EAP. To see the WMP, the user must first navigate to the *Master Schedule* and search for *Sampling Tasks*. On the search results screen, use the *Other Actions* drop down to select either *WMP View* or *Search for WMP View* (Figure 35).

Figure 35. Master Schedule

3.1.2. The Master *Schedule – Workplace Monitoring Plan* will provide a way to see the hazards and EAP score (Figure 36) to use for prioritizing the sampling tasks for special surveillance.

Figure 36. WMP View

3.1.3. Special surveillance task may be scheduled as resources are available. The user will need to find the task in the *Master Schedule*, enter a *Projected Due Date*, and select a member of the program office from the drop down for the *Personnel Assignments* (Figure 37).

Figure 37. Personnel Assignments

3.2. Measure Exposure Environment

DOEHRS enables the documentation of environmental and occupational measurements of chemical, biological, and physical agents. This is done at the Process for non-personal sampling and at the SEG for personal monitoring. DOEHRS currently documents measurements of Noise Sound Level, Noise Engineering, Noise Dosimetry, Air Breathing Zone, Air General Area, Direct Reading Air, and Direct Reading Air TWA. Additionally, qualitative IH Assessments can be performed without an exposure measurement under *SEG>IH Assessments*. Industrial hygiene samples may be entered in several areas within the application without a WMP tasks created first. Users may enter samples from the *Master Schedule* or directly from either the *Shop>Process>Samples* or the *SEG>Samples areas.* The fundamental flow for each sample form is the same; however, some unique guidance will be provided later regarding certain specific sample types.

Note: Entering samples directly will automatically create tasks in master schedule and WMP. These will need to have actual start dates and completed dates entered to close them out from the Master Schedule.

Note: If a sample number has not been auto-generated in the Individual Samples menu tile of the Sampling Detail screen, the sampling task will not be visible or accessible from either the Shop> Process>Samples or the SEG>Samples paths of the application. The user will ONLY be able to access Sampling Tasks without sample numbers via the Master Schedule in this case.

3.2.1. Enter General Area Samples

Samples may be entered either at the *Shop>Process* or *SEG* depending on the type of sample collected. General Area samples may be entered from the *Shop>Process*. These sample types include air general area, bulk liquid and solid, direct reading general area, general swipe, and noise sound level/octave band. To enter a general area sample, navigate to the *Industrial*

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Hygiene>Shop>Process>Sample link (Figure 38). On the *Samples* page, select *Add Sampling* from the *Other Actions* drop down menu.
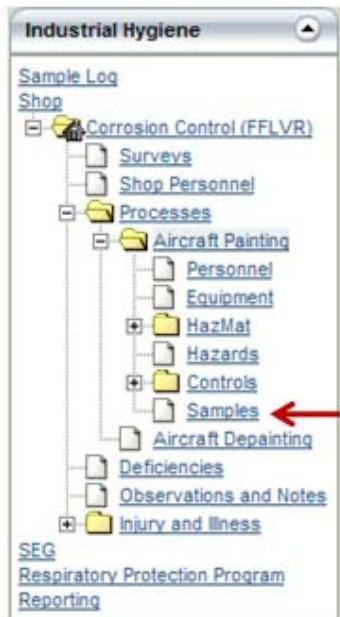

Figure 38. Process Samples

3.2.1.1. Step one is to select the sample type of *General Sample*.

3.2.1.2. Step two is to select the *Process* or *Processes* to sample (the process must be selected by left clicking on the process name, even of only one process is present).

3.2.1.3. Step three is to select the *Hazard* or *Hazards* that will be sampled. Note there are tabs across the top of the page for chemical, physical, and biological hazards.

3.2.1.4. Step four is to select the *Sampling Method* or *No Sampling Method* (if one is not available) for the hazards selected. Note there are also tabs across the top of the page that relate to the sample methods for the different exposure routes. Additionally, only one sample method may be selected so the hazards chosen in the previous step must all have the same method to include them on this sampling form.

3.2.1.5. The last step is to complete the Sampling Form. The user will enter information pertaining to the *General Sampling event*, *Program Office Equipment*, *Hazards, Individual Samples*, *Lab*, *Chain of Custody*, *Associated Samples*, *Ambient Conditions*, and *Attachments*. Adding individual samples to the sample form is discussed below.

3.2.2. Enter Personnel Samples
To enter a personal sample, the user must first navigate to the Industrial Hygiene>SEG>Sample link (Figure 39). On the *Samples* page, select *Add Sampling* from the *Other Actions* drop down menu.

Figure 39. SEG Samples

3.2.2.1. Step one is to select the *Sampling Type* (Figure 40).

Figure 40. Sample Types

3.2.2.2. Step two is to select the *Shop* and the *Process* or *Processes* to sample (Figure 41).

Figure 41. Selecting the Processes to Sample

3.2.2.3. Step three is to select the *Hazard* or *Hazards* that will be sampled. Ensure the correct tab is selected for the type of hazard sampled (chemical, physical, and biological hazards). Note the Date of Last Sampled or Next Scheduled Date (Figure 42). Because this is a WMP scheduled task, the date showing in that column is a future due date.

Figure 42. Selecting the Hazards to Sample

3.2.2.4. Step four is to select the *Sampling Method* or *No Sampling Method* (if one is not available) for the hazards selected (Figure 43). Note there are also tabs across the top of the page that relate to the sample methods for the different exposure routes. Additionally, only one sample method may be selected so the hazards chosen in the previous step must all require the same analysis to include them on this sampling form. There is currently a DOEHRS error in displaying this data when requesting multiple analytes for a single sample. Ideally, hazards that share a common method and media should display across a single row, rather than multiple rows.

Figure 43. Selecting Sampling Method

3.2.2.5. The final step is to complete the *Sampling Form*. The user will enter information for *General Sampling*, *Personnel* (applicable to the worker that will be monitored), *Controls*, *Program Office Equipment*, *Hazards*, *Individual Samples*, *Labs*, *Chain of Custody*, *Associated Samples*, *Ambient Conditions*, *Location,* and *Attachments*.

3.2.2.6. The forms for the different types of sampling are all very similar with minor differences based on the collection method (i.e. Program Office Equipment versus collection containers) or other variables. The sample form is used to document the sampling event which includes the program office monitoring equipment used, hazard information and controls in use, lab information, chain of custody, associated samples, ambient conditions, and for personal sampling, information pertaining to the person sampled.

3.3. Adding Individual Samples

The individual samples collected for the sample event are added to the form by clicking the *Add Record* icon on the Individual samples menu tile. Consecutive samples collected on a given worker for inclusion in a single Time-Weighted Average calculation and associated blank samples should be included in the same sample event as multiple individual samples. For each individual sample entered, DOEHRS will automatically generate a unique sample ID number. This is the primary base sample number to provide to USAFSAM Chemistry Lab when submitting samples. The user may use the field sample number to document the legacy sample number if so desired, but this is not necessary or required. All data pertaining to the type of sample and the date collected are already tracked through DOEHRS. **Again, the DOEHRS generated sample number is the number that should be sent to the analytical lab.** The type of sample is selected from the *Sample Blank Category* drop down menu. The default selection is sample, but the user may choose trip, field, or lab blank. The user will enter the sample start and stop date and time along with any down time. The user will need to press the calculator icon to compute the total sampling time (Figure 44). After the sample collection information is entered, the user will save the record. The user will be taken back to the Sampling Form where they may use the *Other Actions* drop down to *Print Barcode Labels* for the individual samples and to print the *Sample Form Report*.

Note: Please reference paragraph 3.6.4., Submission of Sample Requests to USAFSAM for Analysis, for interim steps to generate a Sample Form Report to submit with samples to the USAFSAM Laboratory.

Figure 44. Samples

3.4. Entering Sample Results

The *Industrial Hygiene>Sample Log* (Figure 45) lists all outstanding individual samples that have been entered but do not have analytical results loaded. This log provides a quick way to manage samples and ensure the results data is entered for all samples in DOEHRS. It is also a quick way to navigate to the applicable sample when results are returned from the lab. Samples are removed from the Sample Log when a *Date Returned* is entered in the *Lab Information* tile. The user just needs to find the sample number and click on the link. This will take them directly to the sample form where they can then select each individual sample and add the results as

either gravimetric or measurement (Figure 46). Alternately, a Discoverer Workbook is available to retrieve information related to a specific sample number so that it may be located under the appropriate Shop or SEG or in the Master Schedule, as appropriate.

Figure 45. Sample Log

Note: The sample must have at least the Date Sent entered in the Lab Information tile on the Sample Form for it to show up on the Sample Log. Users should enter the remaining information in the Lab Information tile for the notifications to work properly.

Figure 46. Individual Sample Measurement Information

The user may invalidate individual samples or outdate the entire sampling event if necessary. Invalidated samples are those for which an error occurred making the sample unusable. Outdated Samples are Samples that are no longer representative of the process-generated exposure. Time-weighted averages must be calculated after the individual sample results are loaded for personal type sampling. The user may also want to upload the electronic PDF analytical results file provided by USAFSAM Chemistry Lab to each of the samples in DOEHRS to eliminate the need for duplicative data storage.

3.5. Time-Weighted Averages (TWA) and Occupational Exposure Limts (OEL)
Occupational exposure limits (OELs) and action levels are loaded for most Hazards in DOEHRS. If one is missing, it can be added during monthly data maintenance after submitting a request to the MHS Help Desk. Each sample included in a TWA can be compared to the appropriate OEL. Additionally, IH Assessments including multiple exposure measurements can be evaluated against the appropriate OEL. ***Pay attention not to use the same sample in more than one TWA calculation for the same time period.***

3.5.1. Time-weighted averages (TWAs) are computed by navigating to the applicable *SEG* and selecting the *Sample* link. This will open the *Samples* screen. There are tabs across the top for each type of sample associated with the SEG. This includes personal sampling as well as general sampling that has been entered at *the Shop>Process* level for processes that are associated with the SEG. To calculate the TWA, the user will need to select the tab with the *Air Breathing Zone*,

Noise Dosimetry, or *Direct Reading Dosimetry* samples. Select the samples to include by checking the box next to it and then pressing the *Calculate TWA* button (Figure 47).

Figure 47. TWAs

3.5.2. Step one requires the user to select the *OEL* to use for comparison (Figure 48). The user may also select the no OEL for this hazard option.

Figure 48. Selecting the OEL

3.5.3. If an adjusted OEL was selected step two will require the user to clarify the type of adjustment to be made. If not, then step two (or three if adjusted) will require the user to select how to deal with any unsampled part of work, if any, and the TWA time period (8 hours for normal work shift, 30 minutes for a ceiling, 15 minutes for a STEL, etc) and press continue (Figure 49).

Figure 49. Documenting Exposure for Work Day Not Sampled

3.5.4. The user will now be on the *Air Breathing Zone TWAs* tab (Figure 50). The results will list the personnel monitored, date, hazard, calculated TWA value and show the OEL type (NIOSH, ACGIH, OSHA, etc) and OEL value. The user may click the notification letter icon next to the name of the person monitored to get an exportable letter that may be used to meet OSHA employee notification requires. The user may also outdate (archive) a TWA by selecting the sample and clicking the *Mark TWAs Outdated* button.

Figure 50. TWAs

Note: The notification letter icon is only available for samples that have been used to calculate a TWA.

3.5.5. At this point the user may conduct the quantitative assessment or reassess one previously done using the new quantitative data.

3.6. Special Air Sampling Guidance
The following sections highlight some unique guidance required to effectively use DOEHRS.

3.6.1. Selection of Sampling Method
When entering a new IH sample (air general area or air breathing zone) in DOEHRS, a pop-up window is displayed to help identify if a particular sampling and analytical method is applicable to all identified "hazards" being requested for the sample. It is important to determine if the selected hazards can be sampled and analyzed with the same method and media. If the selected hazards are not compatible with a single sample method, the sample should be canceled and separate samples created for each unique sampling and analytical method appropriate to the

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process hazards. DOEHRS should group and display common sampling and analytical methods on a single row and limit selection to compatible methods and analytes. Unfortunately, at this time, the common items do not display in the same row as intended and DOEHRS will enable the selection of incompatible methods and analytes. A change request has been submitted to correct this but the user should pay particular attention to the selection of a sampling and analytical method given the fact that DOEHRS will enable selection of a method that may NOT be appropriate. This point can be illustrated in example priming process using a paint containing lead and xylene. DOEHRS will display a table indicating the appropriate sample media for lead using NIOSH 7300 and the appropriate sample media for xylene using NIOSH 1501 (along with some other applicable methods which are not relevant to illustrate the point that follows). The user should quickly realize there is not a single common method that can be used for the collection and analysis of both lead and xylene on a single media and then should cancel and start over by limiting the sample to either lead or xylene and creating an additional sample for the other hazard. Unfortunately, DOEHRS will not prevent the erroneous selection of a method and will ultimately enable the creation of a single sample for lead and xylene, despite the difference in analytical methods. BE personnel should recognize the error here and realize that the two methods are not compatible by selecting the "Cancel" button to return to the hazard selection page to remove one of the analytes from the sample before proceeding. In the example just described, the user would only select xylene, and then select NIOSH 1501, prior to completing the remaining sample collection information. The user would then separately create a sample for lead, select NIOSH 7300, and proceed to complete the remaining sample collection information for that separate sample.

A change request has been submitted to provide the user a warning that the "hazards" not supported by the method selected will be dropped from the sample and that they should create an additional sample for those "hazards" that cannot be analyzed by the selected method. Again, from the example above, if the user selected NIOSH 1501, a warning message would pop-up indicating lead is not an appropriate hazard for the selected method and the user would be instructed to generate a separate sample for lead. Lastly, there are a handful of sample and analytical method combinations that really can be ran against a single sample media and the change request will incorporate information to allow this combination (multiple methods) as appropriate.

3.6.2. Identification of Sample Hazards
There are a few unique chemicals where the OEL is based on something other than either the chemical compound itself or is based on something the sampling method cannot uniquely determine. Lastly, the chromium compounds pose unique challenges in terms of documentation. There is an on-going project to better enable the appropriate relationship among a chemical compound, a sampling analyte, and the OEL. Until the changes are implemented in DOEHRS, there are some unique approaches to documented each of the different scenarios.

3.6.2.1. **Chemical Compound where OEL is based on a Chemical Element.** In this example, the OEL for the chemical Cadmium Sulfide is actually based on the amount of Cadmium. In this example, it is appropriate to identify both Cadmium Sulfide and Cadmium as the Process Hazards, but only the Cadmium needs to be selected as the Sampled Hazard. Ultimately, the lab

method would only return a value for Cadmium, which can be used directly in the TWA calculation, compared to the Cadmium OEL, and subsequently used in an IH Assessment for Cadmium.

3.6.2.2. **OEL is for a Chemical Compound but the Sampling and Analytical Method will only return the Chemical Element.** Titanium Dioxide is a perfect example of this situation. The ACGIH TLV is based on the total amount of Titanium Dioxide. When sampling using NIOSH Method 7300, the lab method can ONLY determine the amount of Titanium. The user must calculate the amount of Titanium Dioxide by comparison of the molar ratios. In DOEHRS, both Titanium and Titanium Dioxide should be identified as the Process Hazards and both Hazards should be included in the Sample. The lab will return the Titanium Value which can be entered into the DOEHRS result for Titanium. The user should calculate the Titanium Dioxide concentration based upon the reported Titanium concentration and enter that result against Titanium Dioxide. The Titanium Dioxide result would subsequently be used in the TWA calculation and ultimately pulled into the IH Assessment. The Titanium concentration would NOT be used any further but should be maintained as documentation of the lab reported results.

3.6.2.3. **Hexavalent Chromium Compounds.** The Air Force guidance for completing exposure evaluations of Hexavalent Chromium Compounds has changed somewhat throughout the years and was impacted significantly with the publication of the OSHA Standard on Hexavalent Chromium. In the simplest of cases, this scenario is very similar to the previous scenario in paragraph 3.6.2.2. Regardless of whether the compound is lead chromate, strontium chromate, zinc chromate, or barium chromate, the OEL is based upon the total Hexavalent Chromium Ion determined by NIOSH Method 7605. Again, each specific compound may be identified as appropriate at the Shop Process level, along with Hexavalent Chromium. The sample, TWA, and subsequent IH Assessment can be done exclusively against Hexavalent Chromium. For those that have read the OSHA preamble to the Final Rule on Hexavalent Chromium and have read the ACGIH Documentation of the TLVs, analyzed the data and determined it is more appropriate to apply the ACGIH TLV for Strontium Chromate (as Cr) for Strontium Chromate, please read on…if you must.

3.6.2.3.1. Strontium Chromate known to be Present. If the MSDS indicates Strontium Chromate in the primer or the workplace records indicated parts have previously been coated with Strontium Chromate Primer, it would be reasonable to consider the exposure to be to Strontium Chromate. In this situation, you would still identify Strontium Chromate (as Cr) and Hexavalent Chromium ion as the Shop Process Hazards and include BOTH as the Sampled Hazards using NIOSH Method 7605. The lab will return the Hexavalent Chromium result which can be used as the result for both the Hexavalent Chromium hazard and the Strontium Chromate (as Cr) hazard, along with their subsequent use in the TWA calculation and the IH Assessment.

3.6.2.3.2. Unknown Chromate Compounds but possible Strontium Chromate. Just like the previous case, you would still identify Strontium Chromate (as Cr) and Hexavalent Chromium ion as the Shop Process Hazards and include BOTH as the Sampled Hazards using NIOSH Method 7605. In this case, it is best to send a supporting bulk sample to determine the other metals present in the workplace. If the molar ratio of Strontium to Chromium is indicative of

Strontium Chromate; you can treat the lab reported Hexavalent Chromium result as Strontium Chromate (as Cr). If the bulk sample results indicate it is unlikely that Strontium Chromate was present, you should "invalidate" the Strontium Chromate (as Cr) hazard and simply enter the lab report results against the Hexavalent Chromium Ion.

3.6.3. Grouping of Certain Individual Samples
DOEHRS enables a single sampling event to have multiple Individual Samples. These Individual Samples would be consecutive samples collected on the same worker for use in a single TWA, along with associated blank sample results. These samples should be grouped together in a single sample event, with each unique sample identified as an Individual Sample.

3.6.4. Submission of Sample Requests to USAFSAM for Analysis
DOEHRS generates a unique "sample number" for each sample entered. While the number does not follow our AF legacy convention (format such as FZ080001, etc.), it is a unique base "sample number" and should be treated as the PRIMARY number to provide to the USAFSAM Chemistry Lab when submitting samples. Like our legacy sample number convention, DOEHRS identifies the type of sample (breathing zone, general area, treated water, etc.); DOEHRS tracks the "year" of the sample (through the date); and DOEHRS provides a sequential alphanumeric value (the sample id)...so it's fundamentally no different than what we did for decades to generate FZ080001 values. DOEHRS simply eliminated the meaningless codes (is that an X or a Z?) and didn't concatenate the values together. A Discoverer Workbook has been created to help fill the void of a "sample log" for those in mourning. Additionally, a solution to streamline sample submission paperwork to USAFSAM and ultimately automate data exchange between USAFSAM and DOEHRS is being worked. The DOEHRS Sample ID will be key to any effort along that line. Separately, for those BE Flights that insist on maintaining a local "manual sample log" (just because that's the way we always did it), the sample number generated from that duplicative process should be entered into the Field Sample ID field under the Individual Sample tile in DOEHRS. This is simply meant as a way to locally track a sample until such time as it is entered in DOEHRS and an official Base Sample Number is generated...the DOEHRS Sample ID.
Note: We have encountered situations where bases have provided their local manual sample log sample id to USAFSAM but not entered it anywhere in DOEHRS. This makes it impossible to cross-reference sample data and fosters the need to external data maintenance. Again, the DOEHRS Sample ID is your unique base sample number and that should be provided to USAFSAM!

The existing DOEHRS report is too complicated and confusing for what is required to accompany a sample submission to USAFSAM. There is a specific Discoverer Workbook titled USAFSAM Sample Submission that is designed to support the submission of samples to USAFSAM. After opening the USAFSAM Sample Submission workbook and appropriate worksheet in Discoverer Viewer, please take the following actions prior to printing.
1. Under "Actions" Menu, select "Printable Page"
2. Select "Page Setup"
3. Update Scaling "Scale" value to 60%
4. Click on Printable PDF button

5. Confirm it opens a Landscape PDF will all columns displayed on one page width.
6. After printing, please identify the "Submitter" by completing the block on the top of the form.

Some critical reminders, some of which may seem obvious, but nonetheless, require emphasis for those other people that need it.

1. The sample number on the printed report must match the sample number on the sample media.
2. The sample number should be the DOEHRS generated number (Sample Barcode ID).
3. Do not submit if the Error Check column indicates an Error (no volume or no time, as appropriate). Go back into DOEHRS and correct the sample and then generate the report.

3.6.5. Display of Censored Sample Results Data
There are multiple methods of dealing with non-detect values in statistical calculations. DOEHRS currently uses a technique which divides the non-detect value by the square root of two. Unfortunately, DOEHRS applies this calculation somewhat prematurely. If you enter your sample results with the "<" symbol under the Individual Measurement results, DOEHRS will take that value and divide by the square root of two prior to displaying the value on any subsequent screen and prior to use of the value in a TWA calculation. This is not appropriate and a change request has been submitted to correct this heinous error.

3.7. Special Noise Sample Guidance
Many BE Flights did not historically use the DD2214 correctly for a single "primary noise source." In the interest of saving paper, the BE personnel would simply enter "multiple" for the "primary noise source" and then enter readings for different noise sources under the measurement location area. This is NOT appropriate. Each noise sound level survey or engineering survey in DOEHRS is against a single Primary Noise Source. The measurement locations and operating conditions capture the relative distance from the noise source and any operational variable in place during the actual measurement. Legacy data was migrated from Command Core for noise surveys, but for those with a "primary noise source" of "multiple pieces of shop equipment" we had to populate the "operating conditions" column with the noise source. Please remember a noise "survey" is done against a single piece of equipment and can have many measurements based on the "operating conditions."

3.8. Reassessing an IH Assessment
As additional sampling data is collected, it is appropriate to reassess an exposure assessment to include the updated data. While there are several ways to accomplish this, reassessments should be accomplished by selecting the *Reassess* button on the *Exposure Assessment* screen.

Figure 51. Reassessment

3.8.1. Reassessments started from the *IH Assessment* screen will require the user to either select the *Perform Qualitative Assessment* button or select the sample or samples to include in the assessment. If samples are selected, the user may *Calculate Statistics* (if at least six samples are selected) or *Perform Quantitative Assessment on One Sample*. Once completed, a new assessment will replace the previous assessment.

3.8.2. Reassessments started by selecting the *Reassess* button on the *Exposure Assessment* screen provide the users with two options (Figure 52). The user will need to select whether they would like to reassess with previously selected samples and statistics or reassess allowing for the selection of additional samples and statistics. If using the same samples and statistics, the user need only select the *OEL* and complete the *Exposure Assessment* page. If the latter is chosen the user will select the *OEL* and the *Samples* and *Statistics* to be used in the updated assessment. In either case, the new assessment replaces the previous one which is archived.

Figure 52. Reassessment Decision

3.8.3. To view the archived assessments, the user may perform a search on the *IH Assessment* screen using the *Other Actions* drop down menu

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4.0. Receive Unscheduled Requests for Surveys
Unscheduled survey requests can be captured in the Observations and Notes area of DOEHRS against a Shop. In order to add the survey requests to the Master Schedule they would have to schedule against one of the available Master Schedule Task Types available in the application. Not all Task Types are currently available. For example, the system does not have an option to schedule a pregnancy evaluation, occupational illness investigation, etc. Regardless, all unscheduled requests for surveys should be documented in the shop's Observations and Notes area, and any other associated documentation should be placed in other DOEHRS areas, as appropriate. Documentation of any correspondence can be stored for the appropriate shop under the Attachments tab.

4.1. Program and budget
A variety of program and budgeting tools are available within DOEHRS. It will take some time to enter all data required as a baseline or starting point in the application before users will have the opportunity to capture information that can support the BE Flight program and budget. DOEHRS has functionality to track equipment, sampling media, training, projected hours (and their associated costs estimates), cost center codes and other areas.

4.1.1. DOEHRS can track actual and estimated costs associated with program office equipment. This is accomplished by the Equipment Administrator. This information is entered at the *Program Office Equipment - Detail* page. Life expectancy and replacement cost are entered at the model number. Maintenance and calibration costs are entered via the *Calibration and Maintenance History* menu tile and the purchase costs are entered on the *Cost Summary* menu tile on the *Program Office Equipment – Detail* page.

4. 1.2. Cost associated with program office personnel may also be tracked within DOEHRS. If the user chooses, they may track actual or estimated hourly costs of the staff by entering in that information in the *Program Office Personnel - Detail* page. Training costs may also be entered under the *Training/Certifications* menu tile. The user may enter the course and travel costs for each training or certification maintained by the program office staff members. This information can assist the BE Flight to identify funding requirements, available resources and resource shortfalls for justification of planning, programming, and budgeting of Occupational Health Program requirements.

4.1.3. Users may also track costs associated with *Master Schedule* tasks such as *IH Sampling*. When creating a sampling task, users may add resource and cost information on the *Master Schedule - Detail* page. This includes the type of consumables and analysis needed as well as the costs for travel, equipment rental, consumables, analysis, and miscellaneous.

4.2. Schedule and suspense
Scheduling and suspense management can be handled from the DOEHRS *Master Schedule*. In addition to a *Master Schedule* task list, scheduled tasks can also be filtered by *Sampling – IH* and *Ergonomic* tasks (*Workplace Monitoring Plan*). The system allows the user to do one-time events or recurring events. For recurring events, the next event is not created until the current event is closed.

4.3. Sick Building/Indoor Air Quality
Sick buildings and indoor air quality investigations may be documented in DOEHRS. General area samples are entered against processes typically located in industrial shops. Since these types of investigations frequently occur in areas other than one of these shops it may be necessary to create a "shop" and "process" to accommodate the sampling data. Once the shop/process creation is completed the user may enter samples and results.

4.4. Respiratory Protection Fit-testing
DOEHRS can track quantitative and qualitative fit-testing. Fit-testing is tracked for the individual on their *Personnel – Details* page. Fit Test scores may be entered manually or imported from the TSI Port-a-Count's FitPlus software. By tracking fit-testing through DOEHRS, reports may be created to assist with program management. Users may create a *Fit Test Status Report* or an *Individual Fit Test Detail Report*. Per current policy, it is not necessary to track military gas mask fit tests in DOEHRS.

4.4.1. Manually Entering Quantitative Fit Test

4.4.1.1. Navigate to the *Personnel – Detail* page either through the *Industrial Hygiene> Respiratory Protection Program>Search* page or by navigating to the *Shop>Shop Personnel* the individual is assigned to. Open the *Personnel – Detail* page and expand the *Quantitative Fit Test* tile and click the *Add Record* icon.

4.4.1.2. The first step is for the user to select the protocol for the fit test. DOEHRS has two protocols loaded: OSHA 29 CFR 1910.134 and US Military Gas Mask. User defined protocols may also be created and used.

4.4.1.3. The second step is to complete the *Quantitative Fit Test* page. Enter details for the test into the *Fit Test Information* section of the form. Enter the required fields which are the fit test date and time, manufacturer, model, mask style/facepiece. To have a complete record of the fit test, it is also necessary to enter a due date, mask size, and select either the Yes or No radio button for *Overall Passed*.
Note: Although the due date is not a mandatory field, if it is not entered, the fit-test status report will list the employee as not fit, regardless of when the fit test was accomplished and if they passed.

4.4.1.4. The user should also enter details for each of the individual fit test exercises, Enter the duration, fit factor result, and check the exclude box and passed boxes as appropriate for each exercise. Once all fit test exercise data are entered, click the *calculator* icon for the Overall Fit Factor Result.

4.4.2. Manually entering Qualitative Fit Test

4.4.2.1. Open the *Personnel – Detail* page and expand the *Qualitative Fit Test* tile and click the *Add Record* icon. Complete the *Qualitative Fit Test* page. Enter the required fields which are the fit test date and time, manufacturer, model, mask style/facepiece. To have a complete record

of the fit test it is also necessary to enter a due date, mask size, the Qualitative Test Type, and select either the Yes or No radio button to denote if they passed. If the *Saccharin Solution Aerosol* is selected as the test type then the user may also select the *Taste Threshold*. Please note again, the due date must be entered for the fit test to report correctly.
Note: The Fit Testing import and export files will contain personal information such as the social security number for the fit tested individuals and must be safeguarded per applicable regulations.

4.4.3. Importing Fit Test into DOEHRS-IH

4.4.3.1. Users may decide to import rather than manually enter fit test records into DOEHRS. This can be accomplished through the *Industrial Hygiene>Respiratory Protection Program>Search* page. To facilitate the import process, the user may want to first Export Personnel, Masks, and User Defined Protocols (if any) for Fit Testing. Many times, the fit test data in FitPlus has been entered without the complete SSN, the name is not correct (i.e. Bill instead of William), or the mask has been entered as FF instead of Full-Face. By exporting the data from DOEHRS the user may then validate the FitPlus data is correct. Accomplishing these activities prior to importing will ensure the data is correctly formatted and will import properly.

4.4.3.2. To Export Personnel for Fit Testing, navigate to the *Industrial Hygiene>Respiratory Protection Program>Search* page and select the *Export Personnel for Fit Testing* link. DOEHRS exports the data as a comma separated value text file. The user should save the file to their computer. The exported file may be opened using Excel. Start Excel and click the open file icon. Ensure that Text Files are selected from the Files of type drop-down and select the file that was created. By default the file is named *FitTestPersonnel.txt*. Step through the Text Wizard in Excel. The user may chose the default settings in the wizard if they so choose. The resulting file will list the first name, last name, and social security numbers for all personnel currently assigned to UICs supported by the program office. This file may be used to scrub the personnel information within the FitPlus database.

4.4.3.3. To Export Masks for Fit Testing, navigate to the *Industrial Hygiene>Respiratory Protection Program>Search* page and select the *Export Masks for Fit Testing* link. DOEHRS exports the data as a comma separated value text file. The user should save the file to their computer. The file may be opened using Excel. Start Excel and click the open file icon. Ensure that Text Files are selected from the Files of type drop down and select the file that was created. By default the file is named *FitTestMasks.txt*. Step through the Text Wizard in Excel. The user may chose the default settings in the wizard if they so choose. The resulting file will list the manufacturer, model, and mask type for all masks currently loaded in DOEHRS for the UICs supported by the program office. This file may be used to verify the fit test mask information within the FitPlus database.

4.4.3.4. To Export User Defined Protocols if users have created fit-testing protocols in DOEHRS, they may be exported for use in the FitPlus database. Navigate to the *Industrial Hygiene>Respiratory Protection Program>Search* page and select the *Export User Defined Protocols* link. DOEHRS exports the data as a comma separated value text file. The user should

save the file to their computer. The file may be opened using Excel. Start Excel and click the open file icon. Ensure that Text Files are selected from the Files of type drop down and select the file that was created. By default the file is named *FitTestProtocols.txt*. Step through the Text Wizard in Excel or the user may chose the default settings in the wizard if they so choose. The resulting file will list the protocol name or names and the specifics fit test exercise for each user defined protocol the loaded by the program office in DOEHRS.

4.4.3.5. After the FitPlus database has been configured properly using the export features described above, the fit test data should be ready to export from FitPlus and imported into DOEHRS.

4.4.3.6. The first step is to export the fit test data file from FitPlus. The following instructions describe the process for FitPlus versions 2 and 3. FitPlus2 export is accomplished by opening the FitPlus database using Microsoft Access. Right-click on Fittest in the Tables list and select Export. Save File As: Text Files (*.txt (text), *.csv (comma separated variables), *.tab (tab separated file), *.asc (ASCII -American Standard Code for Information and Interchange) text). Browse to the location where you want to save the file, name the file, and click Export. Select Delimited and click Next. Select Comma as the delimiter, check the Include Field Names on First Row option and select Finish.

4.4.3.7. If the program office is using the newer version of FitPlus, version 3, the fit test results can be exported directly from the application. Open FitPlus3 and select *the Database>Expor > Comma Separated Values (CSV).* Select the Fittest table and enter a destination file name and click the *Export* button.

4.4.3.8. To import fit test data into DOEHRS, navigate to the *Industrial Hygiene>Respiratory Protection Program>Search* page and select the *Import Fit Test Records* link. Click the *Browse* button on the *Respiratory Protection Program - Import* screen and browse to the text file saved in the previous steps. Press the *Import* button. The *RPP-Import Results* screen will appear. If there are errors with the import they will be listed on this page with the first error encountered for the record. For assistance, the *Respiratory Protection Program - Import* screen has a help icon that will provide information concerning the key import fields and how the data needs to be formatted to allow correct import of the records. After the errors are corrected, the import can be attempted again. Duplicate records will not be imported but the corrected records that now are properly configured will.

5. Reevaluation

5.1. Consolidate Requirements and Update Annual Planning

5.1.1. OEH requirements are consolidated in the DOEHRS database and the schedule is managed primarily from the Master Schedule. The Master Schedule can be filtered in a wide variety of ways and requirements can be listed by date, responsible IH personnel, personnel schedule for the work, shop priority (1,2,or 3), or by status. The user can also view assessments that have been accomplished and sort the requirements by Hazard and EAP. The Master Schedule is a

living document so each user update maintains annual scheduling and beyond. Users can filter tasks by frequencies available to the Master Schedule task.

5.1.2. DOEHRS-IH produces several reports that will assist with managing and tracking *Master Schedule* and *Workplace Monitoring Plan* tasks that are accessed via the *Industrial Hygiene>Reporting* link.

5.1.3. As an add-on to the DOEHRS application, the Oracle Discoverer Business Reporting tool is also available to users of DOEHRS. The Air Force has identified key personnel who have the rights to create template reports. DOEHRS users who have the Oracle Discoverer Viewer role can view these reports. These templates can be used to generate additional information for management and scheduling purposes.

5.2. Create Master Schedule Regulation Report
The user may create a report that lists all tasks that have been entered into the Master Schedule against a regulation. After clicking the *Master Schedule Regulation Report*, the first step is to enter a date range for the report. The user will select the regulation or regulations of interest in step two and press the *Generate Regulation Report* button. The report will identify all tasks that have been scheduled against the selected regulations, who they were assigned too (if so designated), the shop or location of the survey, the shop priority, the projected and actual start dates, projected due dates, and external due dates. The report may be exported as a PDF or RTF file for further editing.

5.3. Create Shop Visit Report
This report provides the user a way to see how many assigned shop visits have been completed, started, or never visited by assigned program office personnel. After selecting the *Create Shop Visit Report* link, choose the program personnel of interest and press the *Generate Shop Visit Report* button. The report lists the information by category and percentage of overall of tasks: *Up-to-Date Visits*; *Overdue Visits*; and *Never Visited*. Each category is broken down by shop name, location, shop priority, and assigned program office personnel. The report may be exported as a PDF or RTF file for further editing.

5.4. Create WMP Status Report
This report provides the user a way to see the sampling tasks that have been assigned that are either outstanding or have been completed. This report is generated by clicking the *Create WMP Status Report* link. The report header shows the current fiscal year and lists the percentage of all completed WMP tasks for the fiscal year, percentage completed required by regulation, and percentage completed not required by regulation. The data portion of the report breaks down each area: Outstanding Tasks Required by Regulation, Outstanding Tasks Not Required by Regulation, Completed Tasks Required by Regulation, and Completed Tasks Not Required by Regulation. For each task, the report identifies the type of sample/assessment, due date, federal standard, SEG, shop, personnel assigned to task, process, hazards (EAP score), and sampling method. The report may be exported as a PDF or RTF file for further editing.

5.5. Repeat Health Risk Assessment Process
The reevaluation phase of the DoD IH Business Process and the Air Force IH Business Process are complimentary. Health Risk Assessments and reassessment of control effectiveness is built into the *Master Schedule* area of DOEHRS as well as at the SEG level of DOEHRS. As more quantitative data becomes available to the user, the DOEHRS application allows for the user to continuously reassess each hazard of concern.   All calls and conversations with the shop should be documented in the *Shop Observations and Notes* section.

5.6. Establish procedures for BE to identify significant process changes
DOEHRS does not have specific functionality to communicate with shop personnel to identify significant process change. DOEHRS allows users to capitalize upon functionality to improve upon procedures for the BE shop to identify significant process changes subject to local policies establishing the process that is followed by the user. The DOEHRS application will allow for observations and notes to be captured for each and every contact with the shop. As an example, if the local policy were to call for each shop to be contacted semi-annually by BE personnel to gather information on process changes, verify personnel rosters, etc, this information can be easily documented in the observations and notes area of DOEHRS.

6. Environmental Monitoring

Environmental Monitoring is tracked against a Location in DOEHRS. Currently, the *Locations* under the *Environmental Health* menu are limited to Base Camps, Installations, and Vessels. Further, they are not editable given the oversight and central management of deployed locations. BE Flights utilizing DOEHRS should create the appropriate locations under the *Administration* Menu and then *Search* for the *Location Name* under the *Environmental Health* Menu. While many samples can be associated against the *Installation* locations, it is possible to subdivide the Installation to Areas or Buildings, as appropriate. Ultimately, DOEHRS will follow the OEH Assessment Model discussed earlier in this document. At present, DOEHRS capability is limited to the documentation of air, water, and soil sample results against the identified locations for those instances where a completed pathway of exposure is of concern. There is some limited scheduling functionality in the water model for routine scheduling of monitoring; however some design flaws limit the ability to take full advantage of this feature.

6.1. Water Monitoring
DOEHRS may be used to document treated or untreated water monitoring results. This is accomplished against a *Location* in the *Environmental Health* menu area of the application. Users may create profiles and sampling points and schedule routine water monitoring for monthly drinking water and other required drinking water sampling such as lead/copper, chemical analysis, etc. There are currently a few limiting problems with using the Routine Water Monitoring functionality for other than bacteriological sampling and associated water quality parameters due to the omission of the ability to enter "<" values. At this point in time, it is suggested that Routine Monitoring be limited to just those bacteriological samples, and associated water quality parameters. Regardless of how treated water results are entered, they are visible under the *Treated Water Kit* link.

6.1.1. Treated or Untreated Water Kit.
Under the *Environmental Health* menu, select your *Location*, and then expand the *Samples* link and select either *Treated Water Kit* or *Untreated Water Kit*, as appropriate. From the *Other Actions* drop-down select *Add Sample*. After populating the mandatory fields, you will need to *Save* the record, at which time a *Sample ID* is assigned. Under the *Individual Samples* tile, a *Sample* and a *Blank* have each been created. Selection of either *Sample ID* link will enable the addition of analytes, reported results and other analytical data.
Note: This DOEHRS functionality is designed predominantly to support a complete drinking water analytical suite and rely upon a lab generated file that can be imported for record population rather than for manual data entry. Regardless, it is still possible to enter analytes and concentration values at this point. To use this functionality with anything other than a complete deployed drinking water kit will require the creation of paperwork specific to the lab being utilized and communication of the DOEHRS import field requirements as documented in the DOEHRS training literature. The single sample number would be applied to each of the requested methods.

6.1.2. Routine Monitoring
The *Routine Monitoring* section of DOEHRS enables the creation of a *Program Monitoring Schedule*. The *Program Monitoring Schedule* is a association of a *Sampling Profile* to a *Sampling Point* with a stated frequency. The *Sampling Profile* defines the routinely collected analytes and the *Sampling Point* is the location of sample collection. The ability to schedule makes this feature more robust than simply using the *Treated Water Kit* functionality. However, as stated previously regarding the Routine Monitoring functionality, there is no ability to enter the results less than the limit and no ability to blank-correct samples with DOEHRS. Therefore, it is likely best at this time to limit the use of this functionality to routine Microbiological analytes.

6.1.2.1. To enter routine water monitoring results, the user will need to create sampling points and profile(s). Navigate to *Environmental Health>Location>Locations – Search* and search for the installation location for the program office. Once found, select that location. Expand the *Location Name* under the *Environmental Health* menu and drill down to *Samples>Water>Routine Monitoring>Program Monitoring Schedule>Sampling Points*.

6.1.2.2. To add Sample Points, expand the *Location Name* under the *Environmental Health* menu and drill down to Samples>*Water>Routine Monitoring>Program Monitoring Schedule> Sampling Points*. Select the *Add Sampling Point* from the *Other Actions* Drop Down or click the *Add Record* Icon. On the *Sampling Point Detail* screen select whether the *Water Type* is treated or untreated. Enter a Building/Site name, Sampling Point name, select the Collection Point from the drop down menu (this will be distribution system if this is a drinking water sampling point), select the Water Use (i.e. Primary or Secondary Drinking Source), select the Treatment Type (multiple types may be selected), and for water use designated as Non Drinking, select the primary use. Enter a Start Date and save the record. The user may also add notes concerning this sampling point and attachments such as pictures or maps of the sampling point.

6.1.2.3. To create Sample Profiles, expand the location name under the *Environmental Health* menu and drill down to Samples>*Water>Routine Monitoring>Program Monitoring Schedule>* *Sampling Profile*. Select the *Add Sampling Profile* from the *Other Actions* Drop Down or click the *Add Record* Icon. On the *Sampling Profile Detail* screen enter a name for the Sampling Profile (i.e. Monthly Drinking Water), select the Type (Inorganic Compounds, Microbiological, Synthetic Organic Compounds, or Volatile Organic Compounds), and enter a Start Date. The user may also add notes concerning this sampling profile and attachments if desired. The Type selected will automatically create a default list of *Analytes* for the profile. The user will select the analytes to include in the profile by checking the box and selecting the Data Type (Range or Presence/Absence). If range is selected, enter the minimum and maximum values of the range and select the units from the drop down menu. Ensure this information is entered correctly before saving the record. Once an analyte is entered, it cannot be removed.

6.1.2.4. To create the Program Monitoring Schedule, expand the *Location Name* under the *Environmental Health* menu and drill down to *Samples>Water>Routine Monitoring>Program Monitoring Schedule*. Select the *Add Monitoring Task* from the *Other Actions* Drop down or click the *Add Record* icon. On the *Program Monitoring Schedule – Add Monitoring Task* screen, select the *Sampling Profile* and *Sampling Point* from the drop downs and check the appropriate radio button whether there is an associated blank or not. Enter a start date and frequency for the recurrence of the monitoring task. If a frequency other than one time is selected, the user will have to specify the recurrence detail which is dependent on the type (i.e. daily, weekly, monthly, etc). Save the record.

6.1.2.5. Once the Program Monitoring Schedule has been created, it is possible to see all the active monitoring tasks for the routine water monitoring program. The tasks lists due dates, sampling points, building/sites, sampling profiles, sample frequency, and last sample dates. Clicking the due date for the specific task will open the *Monitoring Task Detail* screen. The user will enter the sample date, sample time, and results for each of the analytes and save the record. DOEHRS will automatically enter the next recurrence of this monitoring task (if not entered as one-time) into the *Program Monitoring Schedule*.

6.1.2.6. The tasks frequency may be updated by clicking the link under the *Frequency* column on the *Program Monitoring Schedule*. The user may then change the frequency to reflect a new requirement or schedule.

6.1.2.7. Users may view a list of routine monitoring samples that are due or overdue by navigating to *Environmental Health>"Location Name">Samples>Water>Routine Monitoring*. The most overdue will be listed first with the sample profile name and due date. Users may click on the sample profile name where they will be able to sampling results for the monitoring.

6.1.2.8. A *Routine Water Monitoring Report* is also available that shows all samples collected and the results. This report can be exported as a PDF or RTF.

6.2. Soil Monitoring
Soil monitoring functionality works just as the Treated or Untreated Water Kit functionality in the Water Sample section of DOEHRS. There is no capability to establish routine Soil Monitoring schedules, but this would not be a likely scenario. The functionality similarly exists to import results that follow specific formats, as specified in the DOEHRS training literature.

6.3. Air Monitoring
DOEHRS has the abililty to document the results of ambient air monitoring conduct using any of the following methods: Direct Reading, PS1, TO-14, TO-17 Mini-Vol, and DPS. The DOEHRS training material goes into more detail for each of these but it is important to know this capability exists in DOEHRS to document ambient environmental samples taken for the purpose of assessment the health risk to individuals at a given location. The functionality is limited to captureing just the monitoring data and the location. Future versions of DOEHRS will add the ability to prioritize, schedule, identified exposed population groups, and make health risk assessment decisions based upon collected data.

7. Industrial Hygiene Program Metrics
The following metrics are indications that the AF Occupational and Environmental Health Risk Assessment process is being executed based upon DOEHRS functionality. The metrics do not necessarily reflect the overall data quality of OEH practice; rather, they monitor that the appropriate work processes are being completed. Separate efforts will target the actual data quality objectives and will be communicated when available.

7.1. Program Execution Status. This metrics verifies the engine of the OEH process is functioning at the required time-intervals.

7.1.1. **Percent of Routine Surveillance completed** within required time-frames. A healthy BE Routine Surveillance Program results in a completed Periodic Survey within the past 12 months for a Priority 1 Shop and within the past 30 months for a Priority 2 Shop.

7.1.2. **Percent of Special Surveillance completed**, by EAP. Assessments that conclude either More Data Needed or less than High Confidence in the Exposure Classification should be identified for special surveillance. The BE Flight should show progress over time at closing EAPs in the highest range of values prior to those at lower EAP levels.

7.2 **Percent of Processes with Hazards Identified**. Hazards for migrated processes were only identified if sampling data existed. As the BE Flight executes its Routine Surveillance mission, each process must be evaluated to determine the appropriate hazards.

7.3 **Percent of Process Hazards included in a Defined IH Assessment**. This supports the critical aspect of the BE Flight capability in Health Risk Assessment. Every identified Hazard must be assessed.

7.4. **Percent of IH Assessments completed.** For those hazards included in a defined IH Assessment, this metric tracks the percent of Assessments that have actually been completed.

7.5. **Percent of Samples in DOEHRS.** This will run a comparison of samples submitted to USAFSAM and samples loaded in DOEHRS. While possible to obtain sample results from other laboratories, it is expected that every sample submitted to USAFSAM is captured in DOEHRS.

7.6. **Percent of Samples with Time-Weighted Average calculations.** Raw sample data must be normalized to the appropriate OEL time period through a TWA calculation.

7.7. **Percent of Samples included in a quantitative IH Assessment.** The whole purpose of a "sample" is that it is a measurement of a larger "population" of values and multiple samples should be collected for ultimate inclusion in an IH Assessment.

7.8. **The percent of SEG Recommended Controls with matching Shop Deficiencies and Risk Assessment Code.** If the BE Flight is making a recommendation for additional control, there must be a deficiency and you must assign a RAC.

7.9. The **percent of closed SEG Recommendations with updated Process in-place Controls.** After implementation of a recommended control in a particular Shop Process, the control must be added as a Process Control and evaluated to verify it is "adequate."

7.10. **Percent of IH Assessments in Need of More Data or with less than High Confidence in the Exposure Characterization with a Master Schedule Sampling Task.** Enables the appropriate prioritization and scheduling of the identified sampling task.

8. Discover Workbook/Reports

DOEHRS Data Warehouse requirements have been identified and the Business Intelligence Suite of reports and ad-hoc reporting capability is planned for a 2010 release. In the interim, a limited capability exists to query data from the transactional DOEHRS database using Discoverer. BE Flight personnel have access to Discover Reports if they applied for and received a Discover Viewer account. Discover Viewer accounts may be requested during the initial application for a DOEHRS account or at any time later by logging into DOEHRS and navigating to *My Profile*. Discover Workbooks are being created by USAFSAM to address the needs of the Air Force user community to derive ad-hoc reports that are not included in the DOEHRS application. At the current time, limited access has been given to create Discover Workbooks; however, all users with the Discover Viewer account have access to the workbooks that have been created and can use them for querying their data. Given the interim Discoverer Solution against the DOEHRS transactional database, the initial focus of the Discoverer Workbooks has been to make all data retrievable for subsequent analysis and reporting.

8.1. Shop Process Details. Multiple worksheets that should contain all of the current basic characterization information, to include shops, shop personnel, processes, process personnel, process hazards, process controls, and process equipment.

8.2. Shop Deficiencies. Worksheets were created to track deficiencies which are the primary mechanism to make recommendations to workplace supervisors. One workbook is a list of all deficiencies and the second adds the association to "regulatory" drivers. There are often multiple "regulations" associated with a given deficiency, so this will generate an additional record for each "regulation" associated to a given deficiency. For example, a single Hazcom deficiency may have both an OSHA and an AFI requirement, so the second workbook would repeat the deficiency for each regulation but the first workbook will simply cite the deficiency. An additional workbook is available to export all potential deficiencies for use as a checklist when performing periodic surveys.

8.3. Radiation Equipment Inventories. This workbook includes worksheets for Medical/Dental X-Ray, General X-Ray, Industrial X-Ray, RF and Laser inventories.

8.4. IH Equipment Reports. The worksheets in this workbook provide a list of IH Survey Equipment and calibration status.

8.5. SEGs. The worksheets in this workbook provide a summary of SEGs and the associated process, shop, and personnel.

8.6. IH Assessments. Includes multiple worksheets for IH Assessments. These worksheets range in detail from just the overall summary assessment to the inclusion of samples, TWAs, and associated shop and process data.

8.7. Air Samples. Multiple worksheets that include a Sample Log, Samples and TWAs.

8.8. Noise. Multiple worksheets to provide results for each type of noise measurement.

8.9. Routine Surveillance. This workbook includes multiple worksheets to track execution status of Routine Surveillance tasks.

8.10. Master Schedule. This workbook includes multiple worksheets to track execution status of Special Surveillance tasks.

8.11. EH Samples. This workbook includes multiple worksheets to provide air, water, and soil sample results; and details of routine monitoring program schedules and corresponding results.

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